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No. XXVI. OF VOL. II., 1925. LONDON, SATURDAY, DECEMBER 26, 1925. Pp. 104—Price 1s.
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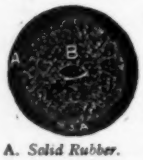

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LECTURE II.*—APPLICATIONS AND RESULTS ON MAN.

THE problem which we are considering is essentially that upon which the greatest of English physiologists made his supreme contribution. In this city (London) in the year 1628 William Harvey published the discovery of the circulation of the blood. Harvey solved the problem qualitatively. It is only now, 300 years later, that physiology has achieved its quantitative solution—the volume of blood that the heart pumps in a minute.

With the general problem now solved, the next step must be the application of measurements of the circulation to physiological study and clinical use. But it is only against a background of the principles of respiratory metabolism, and the mechanical conditions of the circulation, as set forth in the preceding lecture, that we can properly appreciate the significance of the data that are now becoming available from investigations on man himself, the best of all subjects for physiological study.

FAILURE OF PHYSICAL METHODS.

All mechanical methods of measuring the volume of the circulation have failed. When we learned, about 20 years ago, to measure arterial pressure on man, it was thought that perhaps the amplitude of the pulse—that is, the pulse pressure—would be proportional to the stroke volume of the heart. If so, the product of the pulse pressure and the pulse-rate for different times and conditions would indicate the relative volume of the circulation. But the elasticity and capacity of the arterial system are too variable for any reliance to be placed on this method.

Another line which I tried to develop depends on the recoil of the entire body under the impulse imparted to it by the discharge of blood from the heart at each beat. This device would be analogous to determining the weight and velocity of a cannon ball by measuring the extent to which the cannon recoils when the ball is fired out of it. You may see the principle the next time you weigh yourself on a spring balance. After you have dropped your penny in the slot, stand quite still and, if the machine is delicately adjusted, you will see the pointer over the dial vibrating with each stroke of the heart. If you have been exercising it will vibrate more widely. But no very practical results have as yet developed.

SUCCESS OF METHOD BASED ON METABOLISM.

For the beginning of a real solution of the problem we are indebted to the physiologist Fick. Some 40 or 50 years ago he laid down the principle upon which the greater part of what was said in my first lecture is based. It is that we can calculate the circulation from a determination of the amount of oxygen a man or animal is consuming a minute, and from analyses of the gases contained in the arterial blood and in venous blood from the right heart. The oxygen consumption of the body divided by the arterio-venous oxygen difference gives a quotient which is the volume of the circulation. Thus, for example, if the arterio-venous oxygen difference is 5 volumes per cent. and the volume of oxygen absorbed in a minute is 500 c.cm., the volume of the circulation must be 10,000 c.cm. or 10 litres, because 500 c.cm. is 5 per cent. of 10 litres, that is, 500/0·05 = 10,000. The same simple calculation can be applied in order to measure the circulation on the basis of the volume of carbon dioxide exhaled and the arterio-venous carbon dioxide difference.

Zuntz and Hagemann,[1] in their classical investigations on the metabolism and energetics of the horse, first tried to put this principle into practice. Much of the procedure was then new and complicated, and it is not surprising that their results were not very concordant one with another. It is amusing to recall a controversy between Zuntz and Bohr over the results, a controversy which still has a certain significance. Bohr believed that a considerable amount of combustion, at least during muscular work, occurs in the lungs. He argued that the volume of the circulation found by Zuntz would be insufficient to transport to the tissues the oxygen consumed by the animal. If oxygen were consumed in the lungs the Fick principle would not be valid. Conversely, if the circulation is actually smaller during hard work than the Fick procedure shows it, then oxygen is consumed in the lungs, as Bohr believed. In reality, as nearly as we can now figure from the results obtained by Zuntz and Hagemann, although the arterio-venous oxygen differences during rest were certainly much too high, the stroke index of a horse amounts to about 2 c.cm. per kilo per beat—a figure quite close to that which we now know to be correct for all vigorous mammals, large and small.

In the 27 years since Zuntz demonstrated the feasibility of the Fick principle great technical advances have been made, so that analyses which were then difficult and inaccurate are now comparatively easy and exact. We have learnt better how to determine the respiratory gaseous exchange on men and animals; and many investigators can now insert a needle into an artery even of a man and can draw a sample of arterial blood for analysis. From animals it is a simple, painless, and generally harmless operation to draw blood directly from the right heart also by means of a hypodermic syringe inserted through the body wall. As regards the results from animals obtained by many investigators recently, it suffices to say that during rest, probably not very complete rest, the arterio-venous oxygen difference found is usually 4 or 5 volumes per cent. and sometimes as low as 3 volumes per cent. Such figures combined with the oxygen consumption and the body-weights of the subjects (dogs) calculate out to stroke indices of about 1·3 to 1·8 c.cm. per kilo per beat. These figures are for the normal, unanæsthetised, unoperated, healthy animal. But as a rule, under anæsthesia, and especially under operation or experiment, the stroke volume and circulation are decreased far below normal. The arterio-venous oxygen difference rises, therefore, far above normal. Such a depression of the circulation gradually develops towards tissue asphyxia and death.

APPLICATION OF THE FICK PRINCIPLE ON MAN.

On man cardiac puncture is not done, and even the withdrawal of blood from an artery is often a rather troublesome operation. Accordingly, much time and effort have been devoted by many investigators in recent years to developing what we may call respiratory procedures to afford similar data. An essential step was the discovery by Haldane and Priestley in 1905 that by making a sudden very deep expiration through a tube we can obtain in the tube, and can draw off for use, a sample of air from the depths of the lungs; and that this alveolar air is in gaseous equilibrium with the arterial blood. Plesch (1909) gave us the first indication as to how we may obtain air from the lungs which would be virtually in gaseous equilibrium with the venous blood.

* Lecture I. appeared in the last issue of THE LANCET.

[1] For references to literature see note at the end of this lecture.

The simplest procedure developed from this idea is to put into a rubber bag 2 or 3 litres of air, or much better oxygen, containing an amount of carbon dioxide between 5 and 6 per cent. After an initial deep expiration to empty the lungs as far as possible, the contents of the bag are inhaled and blown back into the bag three or four times in 10 seconds. The gas mixture is analysed for its percentage of carbon dioxide; then it is again inhaled for 20 seconds this time and analysed; and again inhaled for 30 seconds and analysed. If these three analyses show the same percentage of carbon dioxide, this agreement indicates that the amount of carbon dioxide in the bag is in equilibrium with that in the venous blood coming to the lungs, after that blood is fully oxygenated, but without at the same time either gaining or losing carbon dioxide.

Such air we call "virtual venous pulmonary air," and the difference between the pressure of carbon dioxide in it and that in "arterial pulmonary air" obtained by the procedure of Haldane and Priestley, gives the datum that we need. It is usually a little more than 1 per cent. of an atmosphere for a normal man at rest. In order to put this quantity into terms of volumes per cent. of arterio-venous difference we must multiply it by a factor for the capacity of the blood to absorb carbon dioxide. This factor is the amount of carbon dioxide that blood will take up and give off for each change of 1 mm. of pressure, or 1 per cent. of an atmosphere, of carbon dioxide. It is obtained from the well-known carbon dioxide dissociation curve of Christiansen, Douglas, and Haldane, and is 0·4 volumes per cent. for 1 mm., or 2·88 volumes per cent. for 1 per cent. of an atmosphere difference of pressure.

There are now available many observations by different investigators by means of methods of this general character. Some have employed more elaborate measures yielding venous pulmonary airs equilibrated in respect both to oxygen and carbon dioxide. Douglas and Haldane measured the circulation in this way on normal men and found in some vigorous persons that the stroke volume during rest is so large that, even up to a metabolism of ten times the basal rate, the oxygen requirements may be met wholly by the increased rapidity of the pulse and the increased percentage utilisation of oxygen from the blood. During exercise their data indicated that the stroke volume in Douglas was not appreciably increased. Both during rest and work his stroke index was 1·9 c.cm. His resting arterio-venous oxygen difference was only 3·2 volumes per cent., thus affording a very large reserve in the oxygen capacity of the blood.

THE STROKE VOLUME OF THE HEART IN MAN.

If this is an accurate indication of the circulation in some vigorous persons, the behaviour of the heart is in accord with a theory which I advanced nearly 20 years ago covering two points: (1) that the stroke volume of the heart during rest is much larger, and the arterio-venous oxygen difference therefore much smaller, than had previously been supposed; and (2) that the stroke volume for all normal heart-rates for any vigorous individual during rest and exercise is a uniform or only slightly varying quantity. These propositions were based on observations and measurements of the volume curves of the hearts of dogs. As shown in Fig. 2 of the preceding lecture, the strokes have an amplitude of about 2 c.cm. per kilo of animal and have a sufficient interval of diastasis (the pause between beats) at slow pulse-rates, so that by an abbreviation of diastasis at more rapid rates a sufficient number of beats of unvarying size could be obtained to afford the largest circulation (as I then thought) needed during vigorous muscular exertion.

The first part of this theory has now been fully confirmed by observations on man, not only those of Douglas and Haldane, but also by similar and somewhat simpler methods by Meakins and Davies, by Henderson and Prince, by Barcroft, Roughton, and Shoji, by Robinson and Burwell, by Bock and his associates, and by a number of others. Thus we now know with a high degree of certainty and precision that the arterio-venous oxygen difference may be even below 4 volumes per cent. in a vigorous person during bodily rest. The stroke index during rest must therefore be 1·5 c.cm. per kilo per beat or more.

Until a few years ago the evidence available indicated that the arterio-venous oxygen difference was of the magnitude of 6 or 7 volumes per cent. From such figures, with those for the basal oxygen consumption at 250 c.cm. per minute, the conclusion followed by simple arithmetic that the circulation was only 3·5 to 4 litres a minute. A circulation of this volume with a pulse-rate of 70 a minute would make the stroke volume of the heart of a man at rest only 50 or 60 c.cm., a stroke index of only about 0·7. When the size of stroke was then calculated for the 10- or 15-fold increase of oxygen consumption during hard work, no conclusion was possible for Zuntz and the other investigators of those days, except that the strokes of the heart are several times as large during exercise as in rest.

We now know that the arterio-venous oxygen difference in a vigorous man or animal is only half as large, and therefore that the circulation during rest is twice as large, as they then supposed. For vigorous exercise we can figure that an athlete of 60 kilos consuming 3 litres of oxygen a minute, with his heart beating 180 times a minute, would just balance his oxygen account if his stroke volume were 100 c.cm. and his circulation, therefore, 18 litres. But there would then be very little oxygen left in his venous blood, less than 2 volumes per cent. The arterio-venous oxygen difference would be more than 16. If in such a man each stroke of the heart during exercise discharged the same volume as during bodily rest, that is the way the factors would balance.

Man is a very vigorous animal, and his vigour is largely based upon the factors of safety, or reserves, afforded by a low arterio-venous oxygen difference during rest and a correspondingly large stroke volume. It is wholly unnecessary and contrary to fact for such an organism, or mechanism, to have to increase the stroke volume 400 or 500 per cent. during muscular exercise as everyone believed only a few years ago. It seems probable that during all moderate activities about one's room or office or laboratory, with pulse-rates from 60 to 80 or 90, or possibly a little more, the circulation in vigorous individuals varies in proportion to the pulse-rate, and that the stroke volume of the heart is not appreciably increased. During more vigorous muscular work, however, I have come to doubt that this uniformity of stroke volume is maintained, and to regard it as probable that at a pulse-rate of 150 beats per minute, or 180 during an athletic contest, the stroke index may be increased to as much as 3 c.cm. per kilo per beat, or about double the stroke volume during rest. But it was only when a better method became available that this point was established.

On the whole, the results that have been derived from the application of the Fick principle to man are clear and important. But the method is really one solely for the laboratory, for research and instruction purposes. It requires special precautions and the coöperation of a trained subject; and even then the error of the method is 10 to 20 per cent. It becomes quite unreliable as soon as, owing to muscular activity or disease, the capacity of the blood to absorb and transport gases is altered.

THE NITROUS OXIDE METHOD.

Accordingly, Krogh and Lindhard attempted some years ago to develop a method based on the rate at which nitrous oxide is absorbed into the blood, when it is inhaled with air somewhat as in the procedure of Plesch above described. This method, in the form in which its inventors describe and use it, is not only more difficult, but far less accurate than the application of the Fick principle. Many other

investigators have tried to use the method of Krogh and Lindhard, but all have given it up. Its results are often widely discordant, not only with the now known volume of the circulation, but also with each other. In successive determinations on the same subject under uniform conditions, the results are often twice as large in one as in the next, instead of nearly identical as they should be. Krogh and Lindhard regard these variations as indicating the variable volume of the circulation, but they are in reality errors inherent in the method. It was considered by Krogh and Lindhard to be necessary that the whole procedure or inhaling and exhaling the gas mixture should be completed in a time (30 or 40 seconds) less than that in which some of the blood makes the round of the circulation and returns to the lungs again. They argued that after this period, not only would nitrous oxide be going into the arterial blood from the air in the lungs, but some of the gas would be returning to the lungs in the venous blood. In fact, however, so brief a period renders it impossible to attain complete mixture of the inhaled gas with the air in the lungs and accurate determinations of the concentrations of the gas at the beginning and end of the period.

In spite of the failure of their method, physiology is greatly indebted to Krogh and Lindhard for this first gallant attempt to use a foreign gas as the means of measuring the circulation. To a certain extent my own recent investigations take their origin from it; for noting its defects I determined to use much longer periods of inhalation, to use a gas which could be more easily analysed, and to try to work out a correction (which has by good fortune proved unnecessary) for the amount brought back to the lungs by the venous blood.

PRINCIPLES CONTROLLING THE ABSORPTION OF GASES.

Consequently, I have now to describe a method, recently developed by my associate Dr. H. W. Haggard and myself, which seems, on the basis of the rather extensive data already available, to afford a simple, accurate, and almost universally applicable solution of the problem of measuring the circulation in man. For more than 20 years I have been searching for such a method. I had reached the point that I never expected to find it, and an equally fixed determination never to cease searching. The discovery was the result of a bit of good luck happening in the course of a systematic search.

In my laboratory we have been for some years past studying the action on man of all the varieties of gases and vapours which occur in modern industry, and which we all inhale (from motor-cars, coal smoke, illuminating gas, &c.) to some extent. Haggard had also made a very thorough study of the absorption and elimination of ethyl ether in connexion with anæsthesia. Out of these studies we had developed certain principles governing the absorption and elimination of volatile substances through the lungs, and particularly some mathematical formulæ, from which a number of important considerations became evident. All of the considerations thus derived proved on experimental test to be sound and practical. I have discussed them and have given the formulæ quite fully in some lectures [2] on anæsthesia and related matters recently. So only a few of the formulæ need be repeated now. The quantities considered and their symbols are as follows:—

(L) Effective pulmonary ventilation in litres per minute, that is, respiration minus the volume of air which merely enters the dead space.

(C) Concentration of the gas in milligrammes per litre of inspired air, when warmed to body temperature and saturated with moisture, as it is in the lungs.

(K) Coefficient of distribution of the gas between equal volumes of lung air and pulmonary blood.

(G) Litres or kilos of blood in active circulation in the body. In other words, the effective blood volume at the time.

(B) Circulation, defined as the number of litres or kilos of blood flowing through the lungs in one minute.

(W) Body-weight in kilos.

By combining these quantities we obtain the following formulæ:—

(1) LC = the amount of the gas inhaled into the lungs per minute.

(2) $LC \times \frac{L}{BK + L}$ = amount of the gas again exhaled from the lungs per minute.

(3) $LC \times \frac{BK}{BK + L}$ = amount of the gas absorbed per minute into the blood, before any of the blood completes the round of the circulation and returns to the lungs from the venous side; that is, the initial rate of absorption.

(4) $\frac{LCK}{BK + L}$ = amount of gas in milligrammes absorbed per litre of blood flowing through the lungs.

(5) $\frac{LCKG}{BK + L}$ = amount of gas absorbed during the first complete circulation of the blood, which is accomplished in the time $\frac{G}{B}$, a period less than one minute even during bodily rest.

(6) $\frac{LCKG}{BK + L} \times \frac{G}{W}$ = the amount of the gas brought back to the lungs by the venous blood during the second round of the circulation.

In these formulæ, the solubility of the gas in the blood (usually nearly the same as its solubility in water and expressed by K) exercises a dominating influence. If we examine this influence as revealed in the formulæ, we find that the rate at which a quite soluble gas (with a high value of K) is absorbed into the body, is determined to a very large extent by the volume of breathing (L), and to a very small extent by the circulation (B). Gases and vapours of a high solubility are therefore quite unsuited to use for measuring the circulation. On the other hand, with gases and vapours for which the coefficient of solubility (K) is small, the rate of absorption from the air of the lungs into the blood is little affected by variations in breathing (L), but depends almost wholly on the blood flow through the lungs. With this principle to guide us, we undertook to make a systematic test of all organic gases and vapours of low solubility. This search might have kept us busy for years but for the chance which led us early to try the vapour of ethyl iodide.

THE ETHYL IODIDE METHOD OF MEASURING THE CIRCULATION.

Ethyl iodide is a liquid with an odour somewhat like chloroform. It is as volatile as alcohol; and the vapour, as we have determined, has a solubility, or coefficient of distribution between air and blood in the lungs, which is expressed by 2; that is, when the alveolar air contains a certain number of milligrammes, or fraction of a milligramme, per litre, the blood flowing from the lungs always contains twice this amount per litre.

Ethyl iodide vapour, even when only minute amounts are contained in the air, can be determined, as we have found, with ease and accuracy by the use of iodine pentoxide to liberate iodine. Determination of the amount of this iodine by titration with thiosulphate is one of the most accurate methods of analysis that chemistry affords. The vapour of ethyl iodide mixed with the inspired air is so dilute that an experiment involves the absorption into the body of an amount of iodine corresponding to only about 0·2 g. of sodium iodide. Most important of all is the fact, as we were fortunate enough to discover, that ethyl iodide is decomposed in the tissues, presumably into sodium iodide and alcohol. The amount of ethyl iodide returned to the lungs in the venous blood is therefore so small that no correction seems necessary on this account even when periods of inhalation of 10 to 20 minutes are used.

A few drops of liquid ethyl iodide are vaporised in about 100 litres of air, or correspondingly more for experiments on exercise and large volumes of

[2] To be published in the British Medical Journal and in the annual volume of the Dental Board of the United Kingdom.

breathing, in a large spirometer. The subject inhales this vapour and air through a rubber tube, mouthpiece, and valves, and the expired air passes through a mixing chamber. The technique is essentially like that for the determination of the basal metabolism. It is convenient to combine the two determinations. By a device attached to the mouthpiece, a sample of alveolar air is automatically collected. This sample and equal volumes of the inspired and expired air are analysed iodometrically as above indicated and the circulation is calculated by a simple arithmetical formula—viz., the volume of air breathed per minute (as measured on the spirometer) is multiplied by the difference in the amount of ethyl iodide in the inspired and expired air, and is divided by twice the amount found in the alveolar air. A complete determination takes 30 or 40 minutes, including the calculations. It requires no training or coöperation on the part of the subject. It is a method which seems to be as well suited to the clinic as to the laboratory. It has been subjected to every test and control that we could devise, both on men and on animals, to test its accuracy. Perhaps the best test of all is the concordance of results obtained by this method with each other. In successive tests on the same individual under the same conditions closely agreeing measurements are obtained.

SUMMARY OF RESULTS OBTAINED WITH THE ETHYL IODIDE METHOD.

Many data have already been collected by this method and more are accumulating rapidly. The persons examined range from athletes to patients with well-marked heart disease. The general aspects of the results obtained have been indicated already in the course of these lectures. Thus physical vigour is found to be correlated with a large capacity in the circulation to transport oxygen even during bodily rest and consequently by a low arterio-venous oxygen difference. The athlete in complete rest has a circulation so large in relation to his oxygen consumption that his venous blood contains only a few volumes per cent. less oxygen than the arterial. At the other end of the scale it is found that even the ambulant cardiac patient has a circulation so much slower than normal that the difference in the oxygen content of the arterial and venous blood, even during rest, may amount to 6 or 7 volumes per cent. He has about the volume of circulation that we used, not many years ago, to assume in healthy people.

The athlete is characterised by a heart which during bodily rest makes large beats at a slow rhythm. Thus his stroke index is 1·5 c.cm. or more per kilo per beat. With moderate activity there appears to be little increase in the size of stroke. The increased blood flow is afforded chiefly by the acceleration of the pulse. With increased muscular exertion the stroke volume also increases, so that an athlete whose stroke index at rest (sitting) may be 1·5 c.cm. per kilo per beat, increases to double this volume during vigorous exertion. The total circulation, which is 5 to 7 litres per minute during rest, rises above 20 litres a minute during vigorous exercise, and may even exceed 30 litres (8 gallons) a minute in an athlete of the type that rows in a university crew and during a closely contested race. At the same time, as we have found in collateral investigations, such an athlete is doing an amount of work with his oar amounting to 0·6 horse-power. He is breathing 80 litres of air a minute and consuming between 3 and 4 litres of oxygen per minute. At such intensities of effort as these, and in fact above about 2 litres of oxygen, the reserve chiefly drawn on is the oxygen-holding capacity of the blood, so that the blood may have had more than half of its oxygen absorbed as it rushes through the tissues. When the circulation encroaches on the lower third of this reserve the athlete comes to the end of his physical power.

Observations have been made on a number of women ranging from athletic young girls up to women in middle life. During rest or moderate exertion their circulation is in every way comparable to that of men of corresponding weight, muscular development, and manner of life. For both men and women a sedentary life and overweight show their effects in a smaller stroke index of the heart and more rapid pulse even during rest. The most striking result of these investigations on the circulation in man has been the demonstration of the extraordinary difference between the volume of the circulation when the individual is lying down or standing. This difference in many persons who on every other score would be adjudged healthy may be as much as 40, and in some even 50, per cent. In comparatively few persons it is less than 20 per cent. Thus the circulation may be 8 or 9 litres a minute when the individual is at rest in bed and only 5 or 6 litres a minute after he has been standing quite still for some time. The effect of position on the circulation in animals was studied some 20 years ago by Leonard Hill, and these results on men are entirely in accord with those which he obtained on animals. It should be added that this effect on men was first observed by Bock and Field, whose work has not yet been published, but who called my attention to this important matter. It explains why rest in bed plays so great a part in recovering from fatigue. It affords the strongest evidence that in no occupation should a man, woman, or child be kept standing in one spot and still for more than a very brief period.

Finally, mention may be made of the effect of hot baths on the circulation as revealed in these investigations. As compared with rest in an ordinary temperature, a hot bath increases the volume of the circulation so much that the arterio-venous oxygen difference falls to a lower figure than under any other conditions. Thus it appears that a hot bath involves an intensive hyper-oxygenation of the tissues of the body.

CONCLUSIONS.

Now at last we know with precision the stroke volume of the heart and the volume of the circulation. We know the range of variation in normal men and women, and in general in all mammals. On the basis of such data the activity of the heart and the volume of the blood-stream are here correlated quantitatively with the size, vigour, and gaseous exchange of men and animals during rest and muscular work. The principles underlying this correlation are formulated. The volume of the blood-stream through the lungs is determined from the rate of absorption of ethyl iodide vapour. This method affords an efficient and clinically practicable means of measuring the circulation, not only in normal persons, both those of athletic and those of sedentary habit, but also in patients with moderate cardiac impairment.

Thus the problem of measuring the volume of the blood-stream—the problem which was in effect defined by William Harvey when he discovered the circulation nearly 300 years ago—is now solved.

For bibliography, see Henderson: Physiological Reviews, 1923, iii., 166. For detailed data and tables of measurements, see Henderson and Haggard: American Journal of Physiology, 1925, lxxiii., 194.

YORKSHIRE APPEAL FOR CANCER RESEARCH.—The Yorkshire Council of the British Empire Cancer Campaign, at a recent meeting at Leeds General Infirmary, resolved to issue an appeal next month for £75,000 for research work in the county. The appeal is to follow a meeting of the Council on Jan. 18th. The hon. secretary of the Council reported that the county had been divided into 18 districts, and each district would have three or more representatives on the Council. It would probably cost about £5000 a year to run a cancer research laboratory on up-to-date lines. Sir Berkeley Moynihan said that the idea was to have a cancer research centre in Leeds, and they had every right to expect that work done there would be very fruitful. It was their desire to work in association with the University department of pathology. The University was prepared to offer substantial financial help for a limited period, and to appoint a professor as a member of the full-time University staff to be at the head of the department.

A CLINICAL STUDY OF THE DICK TEST.

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A PAPER was published in THE LANCET from the Edinburgh City Hospital in January of this year by Ker, McGarrity, and McCartney, giving details of their preliminary work with the Dick test.[1] The results obtained at that time were highly suggestive and warranted a continuation, the first essential being to try out a further series of filtrates with a view to finding a reliable toxin. I had been associated with Dr. Ker in testing with one or two of the toxins whose results were recorded in the former paper, and we continued our work with a batch of toxins, prepared as previously described by Dr. J. E. McCartney. We had experimented with five different toxins in addition to those reported on in the previous paper, when we lit on one that we thought was giving critical results, but we had only completed about 100 tests with it when I suffered the very severe reverse of the loss of my chief. Later on, however, I was able to continue the work, and this paper embodies the experience obtained in the carrying out of over 1400 Dick tests.

Variation in Results obtained with Different Filtrates.

It is obvious that the question of choice of toxin to be employed is one of the very highest importance, and a method of accurate standardisation is essential before the test can find its fullest application. The following gives some idea of the varying results obtained with different preparations, and I think it may be fairly inferred from them that the test is quantitative.

For descriptive purposes I have named the filtrates with which these comparative tests were made A and B. Toxin A was supplied me by Dr. R. A. O'Brien and is a product of an American strain of the hæmolytic streptococcus. Toxin B was made by Dr. McCartney from a strain of the organism isolated in the Edinburgh City Hospital. It wil be remembered that this toxin was obtained by growing hæmolytic streptococci isolated from scarlet fever throats in rabbit blood broth for five days, separating the organisms from the filtrate by centrifuging at high speed, and then passing it through a Berkefeld filter. The test dose in all the following experiments was 0·1 c.cm.

A series of 34 scarlet patients, whose day of illness ranged from the fourth to the twenty-ninth, were tested with different concentrations of Toxin B. In 1 in 1000 dilution there were 21 positives thrown up, whereas with 1 in 500 every one of the 34 was positive. Moreover, the negatives obtained with the 1 in 1000 dilution occurred in cases from their fifteenth day onward, with the exception of two in which negatives were obtained on the eleventh and thirteenth days.

Toxin A tried on a batch of 17 diphtheria patients in a dilution of 1 in 1000 gave 14 positives, but this was reduced to 12 when a dilution of 1 in 6000 was used. In 12 scarlet convalescents, however, each dilution showed the same number of positives—viz., 4.

It would also appear that different strains of scarlatinal hæmolytic streptococci produce toxins of varying potency. In a batch of 17 diphtheria patients mentioned above as giving 14 positives when Toxin A was used in a dilution of 1 in 1000, Toxin B in the same dilution gave only 9 positives. Also in the same series of 12 scarlets reported as giving 4 positives with Toxin A we only got 2 positives with a similar dilution, 1 in 1000 of Toxin B.

These examples could be multiplied. Our final choice lay with Toxin B (Toxin No. 1 of McCartney's series). It gave positive results with all the early scarlets in our initial trials, negatives in convalescent scarlets that we were satisfied had been typical cases clinically, and it seemed to be giving a fair proportion of positives in our diphtheria patients. The reaction itself was clear-cut, very few ambiguous or difficult readings being found—the reaction on one occasion being very easily read in a negro baby. Finally the organism was derived from the type of scarlet prevalent in our district. From evidence which is accumulating this would not appear to be a point of great importance, but in view of our knowledge at the time we thought it well to be on the safe side.

[1] THE LANCET, 1925, i., 230.

Criteria of a Satisfactory Toxin Preparation.

A point that will be uppermost in the minds of those who have become interested in this work and propose to investigate the test for themselves, is the question of the potency of the filtrates used in the test. This will apply especially to those who have experience in the Schick test, where the toxicity of the test-substance can be estimated with great precision. Since, unfortunately, up to the moment of writing, no laboratory method has been devised for the standardisation of the toxin preparation used in the Dick test (chiefly owing to the extraordinary and complete absence of response on the part of laboratory animals to the filtrates), it is essential that workers should have some criterion of a satisfactory toxin, and the optimum concentration in which that toxin is to be used. Although I am aware that I am treading on contentious ground, I would venture to suggest that each toxin should be tried out on the basis of its behaviour towards the disease itself. That at least gives us a starting-point. Different dilutions of a filtrate should be employed by those experienced in intradermal work, and that one selected for further exploitation which gives first, at least 95 per cent. of positives in early scarlets before the end of the fifth day, and secondly, at least 70 per cent. of negatives by the thirtieth day. As we have seen in a previous experiment, the use of a more powerful toxin simply increases the percentage of positives in the later stages of the disease. But we already know from our experience with blanching tests, and from the therapeutic application of convalescent sera, that by this time the immunity response has become considerable. It would be wise therefore to take this fact into consideration if we are to regard the Dick test as a measure of immunity to scarlet fever. It is not to be supposed that these figures should be rigidly adhered to. They are simply put forward as a suggested scheme for gauging an appropriate toxin, and the strength in which it should be used. For example, the negative percentage of 70 is, of course, a purely arbitrary one, and as our knowledge of the immunity process increases will require no doubt to be modified. As will be noted subsequently my percentage of negatives in the convalescent stages is much higher, but it seems safer to err on the side of using too strong a toxin than too weak, particularly if the toxin is to be employed later on as an indicator of immunity conferred by the injection of toxin.

It is obvious, of course, that the value of such observations must depend on the number of cases tested and the accuracy of technique. Undoubtedly the latter is a matter of first-class importance, for as we have seen, the doubling of the dose of toxin had a marked effect on the positive rate. Comparable results might be introduced unless very great care was exercised in the measurement of doses, by imperfections in syringes, and so on. The above procedure would limit the titration of filtrates to workers in fever hospitals willing to take the responsibility. In the present state of our knowledge I do not see what other course is open to us.

Method of Applying the Test and Observing the Reaction.

The filtrate was supplied in a dilution of 1 in 100 and kept in the ice-chest until required. On each occasion that a series of patients was to be tested I made up a 1 in 1000 dilution sufficient for the test. A similar quantity of the same dilution was made up to act as a control. This was inactivated by heating in the water-bath for one hour at 100° C., any loss that occurred in the process owing to evaporation being

made good by the addition of sterile distilled water. These diluted filtrates, active and inactivated, were employed throughout in a test dose of 0·1 c.cm.

Practically every series of individuals in whom the test was done consisted partly of scarlets, both early and late, and some other class of patient suffering from diphtheria, measles, whooping-cough, and a small number from chicken-pox. It was felt in this way that if the results in the scarlet patients were working out as they should, the results in the other class could be accepted as reliable. Readings were made of the reaction at intervals of 8 hours and 24 hours from the time of making the test. This was found necessary, as a number of cases that were definite positives at the eight hours reading had disappeared at the 24-hour interval, while it was also found that definite positives at the end of the 24 hours had been indefinite, or even quite absent, at the earlier reading. Generally, however, as most workers have already noted, the reaction was quite visible at the end of five or six hours, and in one case of a lady medical student who drew my attention to it, I saw a brilliant reaction at the end of an hour and a half standing out prominently from the surrounding exanthem. At the beginning of the work in a series of cases, 48-hour and 72-hour readings were also made, but it was decided that these were unnecessary, although it gave an opportunity of noting in a few cases pigmentation after the original brightness of the reaction had faded. I should also add in this connexion that I saw a case recently in a nurse where a reaction was quite definite in the test area and completely absent from the control area at the end of 48 hours. The routine readings were definitely negative at 8 and 24 hours, and she had given a history of having suffered from scarlet 15 years previously.

With regard to the reaction itself there is little to add to the former description given by Ker. Attention has been drawn to the occurrence of a "partial" positive by Okell and Parish,[2] by which is meant a reaction from half to a quarter as large as the usual size. Similar reactions were observed, especially in scarlets about the third week, and were noted as weak positives. In the tables given in this paper they have been included as positives, since in most cases in which this type of reaction occurred in scarlet when the test was repeated at a later date it was definitely negative. I believe, however, that such a result denotes a certain degree of immunity, as in one case in which such a reaction occurred the serum was secured for a Schultz-Charlton test, and produced a certain amount of blanching.

In my experience of the test, having been chiefly in children, pseudo-reactions have not been very common, and I cannot say that I have seen more than half a dozen, though on various occasions minor degrees of the phenomenon have appeared. It seems not unlikely the presence of pseudo-reactions depends on the nature of the protein present in the culture medium for preparing the toxin, which as used throughout this work was prepared from a rabbit blood broth, as previously described by McCartney.

Presence and Persistence of the Reaction in Scarlet Fever.

Table I. shows the results of 746 tests in scarlet patients, in many cases the test being made on the same patient at different stages of his illness. I have been able in this way to collect 110 cases who were tested on two, three, or even four occasions, and all of whom gave positives in the early stages, and later became negative. The percentage of 95·15 of positives in early scarlets is highly satisfactory, and the gradual diminution of these towards the thirty-fifth day is also striking.

Dealing with the large number of notifications of scarlet fever as we do in Edinburgh, allowance must be made for a certain small percentage error in diagnosis. That would account partially for the anomalous results at either end of the illness. But it must also be mentioned that not all the cases that were typical scarlets clinically developed a negative in convalescence. For instance, one case which was tested on the ninth and fifty-first days, and on two separate intervening occasions, remained consistently positive. On the other hand, special notes are available of two cases where consideration of the fact that positive Dick tests were obtained throughout the illness cast doubt on the diagnosis, inasmuch as it had been reported at the time of their appearance that the rashes were not convincing and desquamation not characteristic. Another experience of these persistent positive reactions is worth recording. During the time this work was in progress three cases were admitted to the wards notified as scarlet, but continued to show positive reactions. All developed definite attacks of scarlet while in the ward, and thereafter the reaction became negative. One of these, however, was a typical scarlet on admission, and I have not the least doubt that this was a true relapse. On reviewing the case notes of the other two the impression was obtained that there may have been room for doubt with regard to the original diagnosis.

TABLE I.—*Showing the Persistence of the Dick Reaction during Five-daily Periods of Scarlet Fever.*

Day of disease.	Total number of cases.	Positive.	Negative.	Percentage positive.
1–5	103	98	5	95·15
6–10	110	87	23	79·10
11–15	103	57	46	55·33
16–20	101	33	68	32·67
21–25	116	19	97	16·38
26–30	82	9	73	10·97
31–35	66	3	63	4·76
36–139*	65	4	61	6·15

* All others tested.

Fourteen cases came under my notice of patients taking scarlet fever whose reaction to the Dick test had been previously determined as positive. As an offset to this, one case of scarlet occurred in a patient whose reaction had been read as negative.

Incidence of Dick-positives in Individuals not Suffering from Scarlet Fever.

These tests were performed on patients in the diphtheria, measles, whooping-cough, and chicken-pox wards. The total number, 634, is perhaps small enough to generalise upon, but I must confess to a little disappointment with the findings, considering how well the toxin was working on the scarlet side, when I saw how the results worked out. (Table II.)

TABLE II.—*Showing Results of the Dick Test in 634 Individuals not Suffering from Scarlet Fever.*

Age period in years.	Total.	Positive.	Negative.	Positive percentage.	Positive percentage in diphtheria patients.
0–½	10	2	8	20	—
½–1	28	15	13	53·57	33·3
1–2	64	38	26	59·37	64·2
2–3	87	52	35	59·77	64·7
3–4	50	30	20	60	72
4–5	53	30	23	56·60	72·2
5–10	150	77	73	51·33	63·1
10–15	74	30	44	40·54	36·6
15–20	37	12	25	32·43	34·6
20–30	59	15	44	25·42	17·9
30–40	18	2	16	11·11	—
40–50	4	1	3	25	—
	634	304	330	47·95	—

It will be seen at once from the table that the percentage positive rate nowhere approaches that given by Zingher as the result of his investigations in New York.[3] He found as many as 70 per cent. in his most susceptible age-group, 1–2. Ker, McGarrity, and McCartney found their highest positive percentage rate, 67·8, in the 2–3 age-group. While my figures

[2] THE LANCET, 1925, i., 712.

[3] Jour. Amer. Med. Assoc., 1924, lxxxiii., 432.

bear out the expectation that the highest percentages appear at the time when scarlet fever is most likely to occur, I had been hopeful of results more closely approximating to Zingher's. It should be borne in mind, however, that the total number of persons examined contains a large proportion of measles and whooping-cough patients, 285 out of 634, very nearly one-half of the total. These patients are recruited from the less well-to-do section of the population, and might be expected, as Zingher has already demonstrated, to contain a high proportion of non-susceptibles. I accordingly worked out the percentages in 349 diphtheria patients, and have included them in a separate column. They show a much higher incidence of positives, and indicate, what Ker concluded from his figures, that children take longer to acquire their immunity in this country, and also what those responsible for the conduct of fever hospitals are only too painfully aware of from time to time—namely, the very high susceptibility of these patients to scarlet fever.

Included in Table II. are the reactions of persons giving a previous history of scarlet. These numbered 76, of whom 67 were found negative, a satisfactory percentage of 88·15.

Relationship between the Dick Test and the Schultz-Charlton Phenomenon.

It was anticipated that some interesting results might emerge from a comparison of the Dick test with the results of injecting the serum from the same patient intradermally into the rashes of acute scarlets. In all 27 sera were tested in this way, involving the performance of 54 Schultz-Charlton tests. Each serum was tested on two bright rashes in typical scarlets, the amount of serum used varying from 0·5 c.cm. to 1 c.cm. in each rash.

The first series of cases consisted of patients in the 4th, 7th, 21st, 28th (two cases), 36th, 57th days of disease, and one with a previous history of scarlet at a remote date. Serum from the first three cases mentioned, who were positive Dick reactors, failed to blanch the scarlet rashes on which they were tried, and though carefully watched for, especially in the first two cases, there was no appearance of the reaction described by Blake and Trask. These authors described a reaction, similar to that of the Dicks, produced in susceptibles by injecting intradermally serum obtained from early cases of scarlet fever. One of the 28th day cases, the 36th day case, and the patient with a previous history of scarlet gave negative Dick reactions, and their sera gave excellent extinction phenomena in all rashes. The 57th day case and the other 28th day patient, both typical scarlets clinically, were Dick positive, but their sera produced blanching in every case.

The next series of cases consisted of two groups of 9 patients in each, one group being negative, the other positive Dick reactors. All gave a history of not having suffered from scarlet. The sera from the negative reactors succeeded in all cases in blanching the rashes upon which they were tried; the sera from the positive reactors failed in every instance.

Finally a serum was tried from a case which had given a weak positive reaction. In both rashes in which it was tried blanching was produced.

Apart, therefore, from the two exceptions in the first series, a definite correlation was established between the Dick test and the Schultz-Charlton phenomenon. The surprising thing to me is that there were not more exceptions, because there can be no comparison between the delicacy of the tests. Assuming that by the Dick test we can estimate individual immunity to a specific hæmolytic streptococcal toxin, the amount of toxin used in the test is purely an arbitrary one, and it is reasonable to suppose that a person might give a positive reaction and yet his serum contain sufficient antibody in the comparatively large amount of serum employed in the Schultz-Charlton test to neutralise the toxin over the comparatively limited area affected by the intradermal injection.

Blanching Effects of Antitoxic Sera.

Dr. O'Brien was anxious that we should experiment with his antitoxic sera with a view to investigating their capacity for extinguishing scarlet rashes. In the experiments detailed below, only rashes varying from bright to brilliant were employed, none were later than the third day of disease, and the intradermal dose in every case 0·5 c.cm. in the skin of the pectoral region. Where neat serum was employed, the test was controlled with a scarlet serum known to produce blanching, and with normal horse serum. No higher dilutions than the ones mentioned were tried.

Serum A 4156 was used in three cases undiluted, on two in a dilution of 2 in 5, and in three in a dilution of 1 in 10. Blanching was produced in every instance. In a case of facial erysipelas in the early stages, with a well-marked spreading margin, 0·5 c.cm. of this serum was injected intradermally half an inch beyond the raised edge in two separate sites. In 16 hours the edge had passed over both injected areas, and the erysipelatous flush in the neighbourhood of the needle marks remained of the same intensity as the rest.

Serum A 4200 was tried in one case undiluted, and in two cases in a dilution of 1 in 200. In the former case and in one of the cases where a dilution of 1 in 200 was employed blanching was observed. In the other case, which had a brilliant rash of the "boiled lobster" type, no extinction appeared, and it is of interest to note that this patient gave a positive Dick reaction on his 9th day, which was negative on the 23rd day of his disease.

Serum A 4177 was tried undiluted on two cases, in a dilution of 1 in 50 in two cases, in 1 in 100 in two cases, and in 1 in 200 in four cases. In every instance blanching was observed.

In all cases in which the neat antitoxic serum was used the control convalescent scarlet serum produced blanching, while the normal horse serum produced no effect in the direction of blanching. In three instances, however, the horse serum caused irregular areas of blotchiness.

From time to time in experiments with the Schultz-Charlton test I have noted that with serums obtained from various patients the area and the depth of the blanching has shown a certain degree of variation. While this may be partly attributable to the differences in level at which the needle was introduced, there can be no overlooking the possibility of different immunity responses on the part of various individuals to the disease. In the above cases in which undiluted serum was used one could not fail to be struck by the fact that the blanching effect was more marked than that usually brought about by a convalescent serum.

In two cases, both when serum A 4156 undiluted was injected, there appeared areas of blotchiness at the periphery of the blanching, and also encroaching irregularly on the blanched area. In neither case was the extinction phenomenon masked by this appearance.

Effect of Antitoxic Serum in Neutralising Toxin.

This experiment was undertaken to determine the effect of mixing antitoxic serum with the filtrate used in the tests reported in this paper. Twelve diphtheritic patients were chosen who had given good positive reactions four days previously. The test mixture consisted of 0·5 c.cm. toxin (1 in 100), 3·5 c.cm. normal saline, and 1 c.cm. serum of A 4156. A control mixture was made up by adding 0·5 c.cm. toxin (1 in 100) to 3·5 c.cm. normal saline, heating for one hour at 100° C., and making up to the original bulk of 4 c.cm. by the addition of sterile distilled water. After cooling 1 c.cm. serum A 4156 was added. The test and control mixtures were allowed to stand at room temperature for ten hours before use. In this way the toxin was at its usual concentration of 1 in 1000, and the antitoxic serum in a dilution of 1 in 5.

Of the 12 children tested in this fashion eight gave straight negatives, two gave combined pseudo-negatives at the eight hours reading, and one a combined pseudo-negative at the 24 hours reading. The remaining case showed nothing at the eight hours reading, but at 24 hours a reaction was present in both test and control areas, the test reaction being

slightly larger than the control. The net result was, therefore, that in 11 out of 12 cases this serum was able to prevent the toxin reacting.

Passive Immunity with Antitoxic Sera.

Having definitely assured myself that these sera could extinguish scarlet rashes, and of the capacity of one of them to neutralise the toxin I was employing in my routine testing, I next turned my attention to passive immunity experiments with two of these sera.

The first group consisted of eight patients who at some previous date had been found positive. This was confirmed by retesting and each received 5 c.cm. serum A 4200 intramuscularly. An interval of 24 hours was allowed to elapse and all were again tested. Two of the eight were found negative, the remainder positive. Retested at the end of four days all were positive, one of the previous negatives only showing a weak reaction however. Bearing in mind the failure of Ker to achieve a passive immunity with 5 c.cm. of convalescent serum I considered the possibility of my dosage being too small, and tried another batch of four Dick positive patients with an intramuscular injection of 10 c.cm. of the same serum. The 24-hour and the fourth day retests were all positive. Three other Dick positive patients were thereupon given 20 c.cm. intramuscularly. Two gave positive reactions at both 24-hour and 4th day retests, while the third was negative at the 24-hour and weakly positive at the 4th day retest.

Another serum, A 4177, was employed with better results. Following the same procedure with regard to the retesting of 14 cases previously giving positive reactions, I followed by injecting 10 c.cm. intramuscularly. At the 24 hours retest I found all except one were Dick negative, and this individual remained positive at intervals of four and eight days. At the 4th day retest 13 were still Dick negative; at the 8th day retest four more positives reappeared, whilst two having been discharged from hospital, seven negatives were left. On the 11th day after receiving the serum three of these seven were now positive; two had left hospital, leaving two negative. These negatives were not again retested till the 18th day, when both were found positive.

The above results are interesting in view of the failure of serum A 4200 and the comparative success of A 4177. Unfortunately only two blanching experiments were done with A 4200 in a dilution of 1 in 200, but it seems noteworthy that it should not have succeeded in one of two cases, whereas the more successful serum A 4177 should have been able to extinguish all of four scarlet rashes in the same dilution.

Conclusions.

1. In performing the Dick test the choice of toxin is a matter of great importance, and careful preliminary trials are necessary before embarking on testing on a large scale. From variations in the number of positive reactions obtained by the use of filtrates from different strains of organisms, and by the same filtrates in different dilutions, it is suggested that the reaction is quantitative. The particular toxin selected was employed in a dilution of 1 in 1000, the test dose being 0·1 c.cm. intradermally.

2. The reaction with the particular toxin employed required to be read on two separate occasions, intervals of 8 and 24 hours having been found the most suitable times.

3. Scarlets in the first five days of illness yielded a positive percentage of 95·15 per cent., whereas from the 31st to the 35th day of illness 4·76 were found positive. Between these two periods there was gradual declension in the positive percentage rate.

4. In 634 patients not suffering from scarlet the highest percentage positive rate was 60, obtained at the 3–4 age-period, the age-periods showing the next highest incidence being between 2–3, 1–2, and 4–5, in the order given, all these showing a percentage positive rate of between 55 and 60. In persons with a previous history of scarlet 88·15 per cent. were found negative. The Dick reaction had been previously determined in 15 patients who subsequently took scarlet, and of these 14 were positive, the other having been noted as a negative reactor.

5. A correlationship was established between the Dick test and the Schultz-Charlton phenomenon in 25 out of 27 cases.

6. Three antitoxic sera were tested with regard to their ability to extinguish scarlet rashes. One blanched in all cases in dilutions up to 1 in 10, another in all cases up to 1 in 200, while a third succeeded in one case when undiluted, and in one case in a dilution of 1 in 200, but failed in one case in a dilution of 1 in 200.

7. An antitoxic serum in a dilution of 1 in 5 was able to neutralise the action of the filtrate employed throughout these tests, as judged by its capacity to prevent the filtrate reproducing the reaction in 11 known positive reactors out of 12.

8. Passive immunity experiments were undertaken with two antitoxic sera. One practically failed in doses of 5 c.cm., 10 c.cm., and 20 c.cm. intramuscularly. The other succeeded in 10 c.cm. doses intramuscularly in producing a passive immunity lasting in 13 out of 14 cases up the 4th day, in seven cases up to the 8th day, and in two cases up to the 11th day.

I would like to place on record my appreciation of the help given by the resident and nursing staff of the City Hospital, Edinburgh, whose coöperation in a time of stress alone rendered this work possible. Also to Dr. McCartney for a never-failing supply of toxin, to Prof. T. J. Mackie for much helpful advice, and to Dr. O'Brien for his generosity in supplying various preparations.

THE DICK TEST AT A FEVER HOSPITAL.

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SCARLET FEVER is thought by many now to be a localised disease of the nasopharyngeal mucosa, due to a certain specific strain of hæmolytic streptococcus which produces a toxin locally which is absorbed into the blood-stream, giving rise to the constitutional symptoms and the erythematous rash.

Where secondary infection occurs it is due to the action of the toxin so formed and absorbed lowering the resistance, and thus making the patient an easy prey either for the hæmolytic streptococcus itself or for any of the other nasopharyngeal bacteriological inhabitants. Immunity to scarlet fever must be antitoxic mainly, and cases in which a secondary rash develops during the course of an attack might be explained by the fact that this specific antitoxic immunity had not been developed sufficiently or not at all, and instances of a second attack might be explained in a similar way. As one attack usually confers immunity it would appear that the immunity is mostly antitoxic in nature. In my opinion the comparative immunity shown by adults might be explained, on this hypothesis, by the fact that adults usually have a good antitoxic immunity to scarlet fever, as is evidenced by the fact that the constitutional disturbances resulting from an attack of this disease are usually less marked in adults than children.

The Dick Test for Susceptibility to Scarlet Fever.

Dick and Dick[1] first described an intracutaneous immunity test for scarlet fever, using a soluble toxic filtrate of an hæmolytic streptococcus obtained from cases of that disease. Various modifications in the manner of preparation of this toxin have been recommended. Through the kindness of Dr. Abraham Zingher, of the Department of Public Health, New York, U.S.A., I was supplied in September, 1924, with some of the toxin recommended by him. Zingher's method of preparing it is briefly as follows. Pneumo-

coccus broth containing 5 per cent. citrated horse blood is inoculated with a 24-hour-old culture of the specific hæmolytic streptococcus. This is then incubated for five days and then removed from the incubator and 0·5 per cent. carbolic acid is added to the culture. The resulting precipitate is allowed to settle, and the supernatant fluid decanted and forms the toxin.

The Toxin.—The strength of toxin requisite for the skin test is estimated by comparing the relative results *re* its local action on the skin of a susceptible person in known dilutions. The diluent used is physiological normal saline solution. In the case of the particular toxin used by me the dilution was 1 in 1000. The toxin keeps well both diluted and undiluted, if kept in a cool, dark place, and I found it as potent after eight months as when fresh.

Control.—This is made by heating the toxin as prepared above in a water-bath for one and a half hours at 100° C., and then allowing it to cool.

Technique of the Test.—The skin on the anterior aspect of the middle third of both forearms is cleaned with ether soap and then with ether. 0·2 c.cm. of the diluted toxin is injected intracutaneously into the left forearm, and a similar amount of the diluted control into the right forearm. I used an "Agla" hypodermic syringe, and number 26 gauge rustless steel needles. When the injection has been made there appears immediately at the site of it a raised white weal, varying in diameter from 7 to 10 mm. in diameter. The openings of the cutaneous glands show as small depressions in this weal, and the latter disappears in five minutes or so. Readings of the test and control areas were taken in every case at 6, 12, 24, 48, and 72 hours from the time of injection.

Table I. gives the results of the Dick test on cases clinically diagnosed as scarlet fever at different stages of that disease. The figures show that the majority

TABLE I.

Duration of disease in days.	Number tested.	Percentage—	
		Positive.	Negative.
1 to 5	48	68·8	31·2
6 to 9	16	50·0	50·0
10 to 12	11	18·2	81·8
13 to 15	11	54·5	45·5
16 to 30	69	10·15	89·85
31 and over ..	99	7·07	92·93
Totals	254	24·8	75·2

gave a negative reaction on and after the tenth day of scarlet fever; 190 cases were tested from the tenth day of illness onwards with the results shown in Table II.

TABLE II.

Stage of disease.	Total number positive.	Percentage positive.	Total number negative.	Percentage negative.
10 days and over ..	22	11·6	168	88·4

Many of the scarlet fever cases gave a positive reaction up to the tenth day of disease, after which the majority gave a negative reaction. In most of the positive cases during the first five days of the disease the reaction was distinct (+), and in a few cases a markedly positive one (++). After five days practically all cases gave a gradually less marked positive reaction till after the tenth day, when 88·4 per cent. gave a negative one. I noticed that in severe cases with marked rash and early and well-marked desquamation a negative reaction was developed sooner than in mild cases. One case gave a positive reaction on the nineteenth day of disease, and also again on retesting ten days later, although desquamating when tested, and admitted with a good scarlatiniform rash and mild symptoms to hospital. A similar case was noted on the twenty-fifth day of disease, the reaction remaining positive although desquamating. These two cases might be examples of persons who do not develop antitoxic immunity even though attacked by scarlet fever.

Sixty-five cases were retested one or more times later during convalescence, owing to the fact that there was either an element of doubt *re* original diagnosis or the Dick test when first applied was positive, and might become negative later on. Five cases gave a persistently positive reaction, and did not desquamate or show any complications suggestive of scarlet fever.

In Table III. a comparison is given of the results of the Dick test on 281 cases of scarlet fever as tested by Zingher[2] at the Willard Parker Hospital, New York, and 254 similar cases tested by the same toxin

TABLE III.

Duration of disease.	Percentage Dick-positive, New York.	Percentage Dick-positive, Leicester.
1 to 5 days	98	68·8
6 days and over ..	20	14·56

at Leicester Isolation Hospital. From this table it would appear that antitoxic immunity is developed more slowly in Leicester than in New York, but that in the end the former cases develop a greater percentage of immunes. This is possibly accounted for by the fact that well-marked cases are rare in Leicester, and the present type of case is mild and, therefore, it takes longer for it to develop sufficient antitoxin to become immune. I have already remarked on the earlier development of a negative reaction in well-marked cases with a good rash and early desquamation.

Table IV. gives the results of the Dick test on normal persons not suffering from and without a

TABLE IV.*

Age-group in years.	Number tested.	Dick-negative.	Dick-positive.	Percentage positive.
1 to 3	2	2	—	Nil
3 to 6	20	7	13	65·0
6 to 9	26	11	15	57·7
9 to 12	26	11	15	57·7
12 to 15	11	6	5	54·5
15 to 20	7	6	1	14·3
20 to 25	12	9	3	25·0
25 to 40	7	6	1	14·3
Totals	111	58	53	47·74

* This comprises 58 females and 53 males.

previous history of scarlet fever. From this table it would appear that the greatest susceptibility is between the ages of 3 to 15 years.

Zingher,[3] over a much larger number of cases in New York, gives the number Dick-positive for all ages as 34·4 per cent., whilst Ker[4] gives 51·5 per cent. for Edinburgh, Nesbit[5] gives 50 per cent. in Gary Schools, Indiana, U.S.A., and Okell[6] gives 74 per cent. for 100 medical students in London. The figures are expressed comparatively in Table V.

TABLE V.

Percentage Dick-positive in—				
Leicester.	New York (Zingher).	London (Okell).	Gary, Ind. (Nesbit).	Edinburgh (Ker).
47·74	34·4	74·0	50·0	51·5

Results of Dick Test on Cases of Diphtheria Undergoing Treatment.

I performed this test on 132 cases of diphtheria, composed as follows: faucial (diph.), 99; nasal and faucial (diph.), 19; nasal (diph.), 5; laryngeal (diph.), 3; faucial and laryngeal (diph.), 2; faucial carriers of diphtheria, 4.

Of this number three cases, all from one family, were suffering from well-marked scarlet fever and faucial

diphtheria concurrently, and all three gave a negative reaction Seven of the cases had had scarlet fever previously and all gave a negative reaction. Amongst this group my personal experience of the test might be worth mentioning. Whilst carrying out these tests I was warded with faucial diphtheria, and, having had scarlet fever six years previously, I thought it would be interesting to see if at any period during my attack of diphtheria I would give a positive reaction. Although I tested myself on six different occasions I always gave a negative reaction to the test. I might add that I had on three occasions, previously to contracting diphtheria, performed the test on myself with a similar result. Four of the diphtheria cases were faucial carriers only, and all gave a negative reaction. One diphtheria case giving a negative Dick reaction had been detained in hospital 108 days for complications, when tested, and his throat condition was quite healthy. This case would presumably not be specially susceptible to scarlet fever, as it was well over the convalescent period of diphtheria. Allowing for the last three groups (comprising 12 cases) as not being specially susceptible to scarlet fever, or having had that disease previously, we get 120 cases of diphtheria remaining.

In Table VI. the results are given of the Dick test on 120 cases of clinical diphtheria (all without a previous history of scarlet fever).

TABLE VI.

Age-group in years.	Dick-negative.					Dick-positive.					Per cent. pos.
	F.	N. & F.	N.	F. & L.	L.	F.	N. & F.	N.	F. & L.	L.	
1 to 3	3	1	—	—	—	4	1	1	—	—	60·0
3 to 6	4	2	—	1	—	26	7	3	1	1	84·4
6 to 12	10	2	—	—	—	15	2	1	—	1	61·3
12 to 20	4	1	—	—	—	7	2	—	—	—	64·3
20 to 30	7	—	—	—	—	7	—	—	—	—	50·0
30 and over ..	6	—	—	—	—	—	—	—	—	—	Nil
Totals ..	34	6	0	1	0	59	12	5	1	2	65·8

F. = faucial. N. = nasal. L. = laryngeal.

Table VII. gives the result of the Dick test in diphtheria cases—all age-groups—as displayed by different types of that disease. From this table it

TABLE VII.

Region affected.	Number tested.	Dick-negative.	Dick-positive.	Percentage positive.
Faucial	93	34	59	63·4
Faucial and laryngeal	2	1	1	50·0
Nasal and faucial ..	18	6	12	66·6
Nasal	5	—	5	100
Laryngeal	2	—	2	100
Totals	120	41	79	65·8

will be noted (1) that the most susceptible age-group in diphtheria to scarlet fever is the period 3 to 6 years; (2) the age-group 20 years and upwards, at which there is usually a lessened susceptibility to scarlet fever in normal persons, is least affected by the incidence of diphtheria; (3) nasal as well as nasal and faucial cases would appear specially prone to scarlet fever; (4) the immunity conferred by a previous attack of scarlet fever holds good, even if one contracts diphtheria at a later date they would not appear again susceptible to scarlet fever; (5) the four faucial diphtheria carriers all gave a negative Dick reaction, but whether there is a common antitoxic immunity or not could not be said from such a small number of cases.

Table VIII. gives the relative susceptibility to scarlet fever of normal persons and of diphtheria cases—in age-groups—as shown by the Dick test. From this table it would appear that there is a marked increase in susceptibility to scarlet fever shown by diphtheria cases as a whole, as well as at every age period.

TABLE VIII.

Age-group in years.	Percentage positive—		Percentage increase.
	Normal cases.	Diphtheria cases.	
1 to 3	Nil	60·0	60·0
3 to 6	65·0	84·4	19·4
6 to 12	57·7	61·3	3·6
12 to 20	33·3	64·3	31·0
20 and over ..	21·05	35·0	13·9
Totals	47·74	65·8	18·06

In Table IX. the Schick test for susceptibility to diphtheria was performed on 105 cases of scarlet

TABLE IX.

Age-group in years.	Number tested.	Schick-positive—	
		Number.	Percentage.
½ to 1	1	1	100
1 to 2	3	3	100
2 to 3	3	3	100
3 to 5	25	18	72·0
5 to 10	50	26	52·0
10 to 20	22	10	45·4
20 and over ..	1	0	Nil
Totals	105	61	58·09

fever undergoing treatment with the results shown. From the figures in Table IX., contrasted with those in Table VIII., one sees that there is an increased susceptibility to scarlet fever shown by diphtheria cases as a whole, as compared with that shown by scarlet fever cases to diphtheria; the percentage being 65·8 for diphtheria cases to scarlet fever; 58·09 for scarlet fever cases to diphtheria; 7·71 increase for all age-groups.

General Observations on the Dick Test in Diphtheria Cases.

(1) The test appears to be as reliable an index of susceptibility to scarlet fever in these cases as in ordinary normal individuals, and in all cases with a previous history of scarlet fever a negative reaction was noted. (2) Both in normal persons and in cases suffering from diphtheria there is a very small percentage of positive reactors above the age of 20 years. (3) In four cases an antitoxin (diphtheria) serum rash developed at the same time as the Dick reaction was manifest. This did not interfere with the readings, and the former faded in all cases before the latter, leaving the reaction well marked. (4) The reaction seemed much better marked and defined from the surrounding normal skin area in diphtheria cases than it did in both normal and scarlet fever cases. (5) In 21 cases out of the number of diphtheria cases tested there was a well-marked positive reaction (++)=17·5 per cent. of marked positives. (6) The number of pseudo reactions (both negative and positive) was less than in scarlet fever and normal cases.

Five cases of erysipelas were tested by the Dick reaction also. Of this number four were cases of the facial type and one of the leg. The latter case gave a positive reaction on the third day of illness, and a negative one when tested on the twenty-seventh day of illness. All the remaining four cases gave negative reactions. It might appear that there is some relationship between scarlet fever and erysipelas, but owing to insufficiency of clinical material it would be impossible to draw conclusions till a much larger number of cases had been tested. Clinically the two diseases have often appeared to me to be allied.

The Dick Test as an Aid to Diagnosis of Scarlet Fever.

(1) A positive reaction during the first ten days of illness, gradually getting less markedly positive from the fifth day, would be in favour of a diagnosis of scarlet fever—more especially so if the reaction became negative after the tenth day. (2) A positive reaction persisting after the tenth day of illness would be against the diagnosis of scarlet fever, as also would a markedly positive reaction after five days. (3) The results of the Dick test in normal people bears out the statistics as to the age-incidence of scarlet fever—e.g., a positive reaction during the first ten days of illness in a suspected case, aged 25 years or over, would be in favour of the diagnosis of scarlet fever.

In conclusion I would like to express my thanks to Dr. Zingher, and also to Dr. Okell, of the Wellcome Research Laboratories, Kent, for their kindness in forwarding me samples of Dick toxin for carrying out the tests. I found that the former's preparation gave better results with our cases, and all of this series were tested with it.

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SOME PROBLEMS CONNECTED WITH THE DICK TEST.*

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WE know from the results of recent work in England, which broadly agree with those obtained in America, that the Dick toxin with which we are working is specifically related to the scarlet fever prevalent here. In the first few days of the disease a suitable dilution of the toxin will give a high percentage of positive reactions; these same patients will during convalescence change their reaction from positive to negative; the toxin is neutralised by the serum of patients convalescent from scarlet fever, and the toxin, if given in sufficiently large doses to volunteers, will produce what is in some essential characteristics (temperature, vomiting, and rash) a miniature attack of scarlet fever. We know also that the serum of horses immunised with this toxin contains an antitoxin giving the specific Schultz-Charlton reaction. We may go further and say that the accumulating evidence leaves little doubt that, at least in certain severely toxic cases of the disease, the antitoxin has a definite therapeutic effect. There are, however, a great many points still unexplained, and it is by the close study of these that progress will be made.

It is necessary to avoid changes in toxin while doing experimental work; one must, therefore, have a large volume of liquid toxin available. Scarlet fever toxin is strikingly resistant to heat, and of a much higher order of stability than other well-known bacterial toxins. It is not known at present whether dried toxin, or toxin precipitated by one of the well recognised methods of precipitation, would be more stable than the liquid toxin. Presumably it would be.

The Question of Dilution.

We know fairly closely what are the most suitable dilutions of toxins for use. The question is an interesting one. As Park has pointed out: "If a toxin is a little too strong there will be too many positives; if it is too weak there is a possibility of having people who are susceptible pronounced as immune."

We commenced working with a dilution of 1/6000 of our large bulk of toxin, for with this dilution several of the laboratory staff gave clear positive reactions. Several physicians in fever hospitals have kindly compared the two dilutions 1/6000 and 1/1000. One worker found in the first week of scarlet fever 12 per cent. of positive reactions with dilution 1/6000, while a 1/1000 dilution gave 60 per cent. of positive reactions; for the second week the figures were 6 per cent. and 12 per cent. It is therefore evident that 1/1000 is the better strength to use when testing patients considered to be suffering from scarlet fever. It may, of course, not be the optimum.

Percentage of Positive Reactions.

Different observers, when testing patients admitted in the first two days of the disease, have obtained different percentages of positive reactions. Most workers give a percentage of from 66 to 100, while two clinicians, working with small groups of patients, obtained percentages as low as 22 and 42. Probably a close study of these differences would give information of value. The change from a positive to a negative response to a 1/1000 dilution of the toxin during the disease appears to occur in the average case about the fifth to the eighth day. One point of some interest is that amongst 673 reactions there were but 10 (1·5 per cent.) "pseudo and positive," and 25 (3·7 per cent.) "pseudo and negative." This low percentage we probably owe to the fact that Okell and Watson chose for the growth of the streptococcus ordinary digest medium containing no blood, and, from a study of the growth and metabolism curves, harvested the toxin at 18 hours.

With a 1/1000 dilution of toxin the percentage of positive reactors in different ward staffs varied from 7·5 in a large hospital (106 nurses) to 10 amongst 31 nurses and probationers. Evidently the great majority of nurses of long experience in scarlet fever wards are negative to the Dick test and non-susceptible to the disease. We do not know accurately what percentage of nurses in such wards would give a history of having contracted scarlet fever during their hospital life. It is probably fairly large, but many have no such history. Evidently, as in diphtheria, nurses (and others) may become immune through minute unrecognised infections with the scarlet fever organism. Nurses with positive reactions are generally newcomers. Two nurses in fever hospitals who gave a positive response to the test developed scarlet fever later. We would not be surprised to find that practically every nurse who has been several years in scarlet fever wards has either suffered from an attack of the disease during her hospital career or has already become immune from unrecognised infections either during or prior to life in the wards.

Significance of a Negative Response.

We know broadly that a negative response to the Dick test indicates a high degree of non-susceptibility, but we are not convinced that a positive, and particularly a "partial positive," reactor may not possess some immunity. It will be of great interest to ascertain how high the immunity represented by a negative reaction is. We have already reported that in one hospital, during a certain period, eight patients wrongly diagnosed as suffering from scarlet fever who gave a negative Dick reaction were admitted to the scarlet fever ward, but none developed the disease from ward infection, whereas of six positive reactors similarly admitted four developed the disease within a short period of admission to the ward. In another hospital a case of scarlet fever made its appearance amongst a group of 50 convalescents who were closely associated; 37 of these were "Dick-negative," none developed the disease, while of 13 who were "Dick-positive," six developed scarlet fever. On the other hand, we have notes of two instances in which patients were apparently negative to the Dick test when 1/1000 dilution of

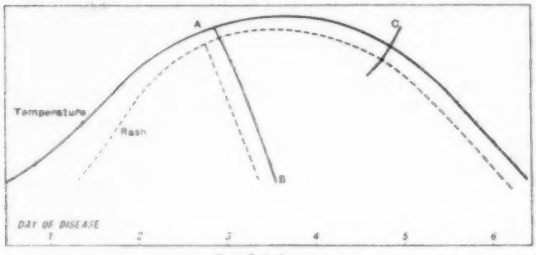
* A paper read at a meeting of the Fever Group, Society of Medical Officers of Health, Nov. 27th, 1925.

toxin was used, yet shortly afterwards developed an attack of what was considered to be typical scarlet fever. Such instances do not materially affect the main thesis; for the moment we simply place them on record.

With regard to the application of the Dick test to diagnosis in the disease, it will be necessary to get a clear idea of the immunity curves of the disease. This will not be completely and satisfactorily done until one can as easily measure the toxin and antitoxin of scarlet fever in the laboratory as those of diphtheria. We have constructed a hypothetical curve which may well record what happens during an attack of scarlet fever.

In Curve 1 the heavy line diagrammatically records the temperature and toxæmia in an ordinary attack

FIG. 1.

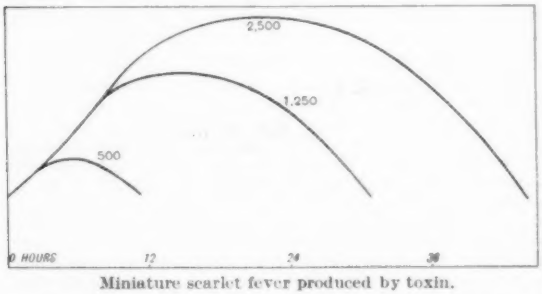


Scarlet fever.

of scarlet fever, while the interrupted line records the development of the rash. Results recorded in England, as well as many observations from America, justify one in saying that if one gives at point A a sufficient dose of scarlet fever antitoxin produced in the horse, the temperature and rash will rapidly fall as at B, and the patient's serum will be found to contain sufficient antitoxin to give the Schultz-Charlton blanching in fresh cases of scarlet fever. We may therefore reasonably assume that at point C in an ordinary case of scarlet fever, untreated with antitoxin, the temperature and rash rapidly fall, because the patient has himself produced a large quantity of antitoxin which has been made in those cells of his body that manufacture antitoxin, and has there accumulated until it has been given off into the circulating blood to such an extent that the patient's serum will now give a Schultz-Charlton phenomenon when tested on a fresh patient.

Curve 2 represents observations made with our toxin. 500 skin reacting doses will produce either no temperature or a disturbance scarcely recognisable,

FIG. 2.



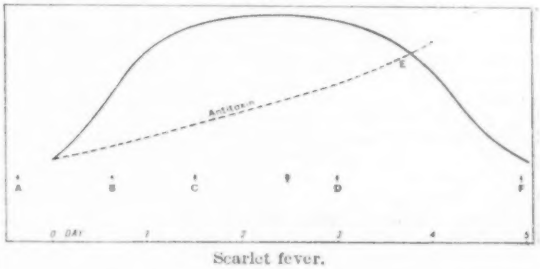
Miniature scarlet fever produced by toxin.

and lasting only perhaps a few hours; 1250 doses will produce in some instances a miniature attack of scarlet fever—i.e., slight sickness, temperature, and rash, lasting 24 to 48 hours—while 2500 doses will produce in most instances vomiting, fever, and rash lasting about two days. We can from this get a quantitative idea of the *minimum* amount of toxin produced in an ordinary attack of scarlet fever.

In Curve 3 we have represented what we conclude is occurring in an ordinary attack of scarlet fever. At point A—i.e., just before infection, or in the very earliest stage of the incubation of the disease before any symptoms have been produced—it is probable that weak toxin—e.g., 1/6000 dilution of our standard toxin—would yield a positive reaction. If we test again at point B the patient has begun to produce a minute amount of antitoxin in response to the toxin stimulation which has been going on for some 24 or 48 hours; we now find that the antitoxin is sufficient to neutralise a toxin dilution of 1/6000 but not 1/1000, for this latter dilution gives a positive reaction, while 1/6000 yields a negative. If we wait until point C we might find that the rapidly increasing antitoxin in the patient's blood or skin cells would neutralise a dilution of 1/1000 but not 1/200; at point D it might take 1/10 to produce a reaction; while at point E sufficient antitoxin has accumulated in the cells or blood to neutralise all the toxin secreted by the attacking organisms during the disease; and after point F the patient gives a permanent negative response.

We would suggest that attention should be concentrated on the study of the earliest period of the disease. If the patient is not admitted until the second or third day and gives a negative response to 1/1000 dilution, will he give a positive response to 1/500 or to 1/100? If when admitted on the second or third day he fails to give the Schultz-Charlton test when 0·2 c.cm. of 1/10 dilution of a good horse antitoxin is injected intracutaneously, will he give a positive Schultz-Charlton test when 0·5 c.cm. of 1/10 dilution is injected or even 0·5 c.cm. of undiluted horse antitoxin? (With this latter dose it would, of course,

FIG. 3.



Scarlet fever.

be necessary to use a control intradermic injection of undiluted horse serum containing no streptococcus antitoxin—e.g., diphtheria antitoxic serum.)

Are There Different Types of Scarlet Fever?

Are all scarlet fever toxæmias due to the same toxin or are there different toxins in true scarlet fever—in other words, are there immunologically different types of the disease? One of us (C. C. O.) has long felt that there might easily be an overlapping of antigens beween the so-called true scarlet fever streptococcus and other streptococci, at least other hæmolytic streptococci. Recently a hæmolytic streptococcus, isolated by Sir Frederick Andrewes from a spreading lymphangitis of the arm, has yielded, when grown on the same media as the Dick and Dochez coccus, a filtrate which gives a typical positive Dick reaction in a known Dick-positive reactor, and a negative in a known Dick-negative reactor. We do not know yet if the toxin is neutralisable by true scarlet fever antitoxin. As yet the relationships between the various streptococci and their toxins have not been sufficiently investigated. This field is rich in interest.

Dr. C. Rundle has had the idea that there may be two or more types of scarlet fever, and has worked particularly by the Schultz-Charlton method. Furthermore, Dr. Park has in a recent paper suggested that there may be a wide antigenic overlap between the different streptococci, that—e.g., while the ordinary scarlet fever toxin contains antigenic or toxin components *a*, *b*, *c*, *d*, others may exist which contain *a*, *b*, *e*, *e*, and so forth.

It is stated that during convalescence after what seems to be typical scarlet fever a certain number of

patients continue to give a positive Dick reaction. The point needs further investigation. If such patients exist, have they cured themselves of their fever by producing antitoxin which is still locked up intracellularly, and are the cells slow to excrete the antitoxin into the blood-stream? Will they become later negative to the Dick test? Have they responded to the primary stimulus of the toxæmia and, if injected with, e.g., 500 skin doses of toxin during convalescence, will they rapidly produce sufficient antitoxin to make them negative to the Dick test? These and many other interesting points can be worked out only by those having the opportunities of making clinical observations. In the laboratory, until a satisfactory test is discovered, we can do but little.

We may here mention an interesting question for investigation. How stable are the dilutions of toxin? We have considerable evidence that they are stable for at least two weeks. This is a small practical point, but one it is important to know in order to avoid fallacies in making a series of observations. It is obvious that the old and the new dilutions must be tested on the same subject.

THE HEPATIC ASPECT OF EPIDEMIC ENCEPHALITIS.

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THE association of hepatic cirrhosis with disease of the basal ganglia is well known, the outstanding example being found in Wilson's progressive lenticular degeneration. Other amyostatic syndromes, such as torsion dystonia, paralysis agitans, &c.—each presenting definite clinical features—are less clearly defined from the pathological standpoint, and it is doubtful to what extent, if any, hepatic derangement takes a part. Clinically, there is but little to suggest an insufficiency of the liver in the majority of instances—even in advanced cases of progressive lenticular degeneration. There are but scanty reports of chemical investigations as to the efficiency of the liver during life; the researches of Dresel and Levy on paralysis agitans and of Ivens on Wilson's disease suggest, however, that defective liver function does occur and can be demonstrated by laboratory methods, although absent clinically.

The object of the present investigation is to ascertain whether evidence exists, suggestive of hepatic involvement in the amyostatic manifestations of encephalitis. Most of the cases chosen have been examples of the Parkinsonian syndrome arising late in the course of a chronic progressive lethargic encephalitis.

Clinical Evidence of Hepatic Derangement.

It is rare to encounter, either during the acute or chronic manifestations of the disease, clinical evidence of hepatic derangement. Although continental writers have occasionally drawn attention to such phenomena, the experience of most English neurologists has been that encephalitis is rarely characterised by signs suggestive of liver involvement. Mlle. Lévy, however, in her recent monograph, states that she has observed jaundice several times in the course of the disease. Van Bogaert (1924) has recorded a case of post-encephalitic respiratory disorder in which jaundice appeared nine months after the onset of the illness, and persisted for a fortnight; there was no discoloration of the stools, but bile-salts were detected in the urine. Ottonello (1924) found signs of enlargement of the liver in eight out of 15 cases of Parkinsonism. Pedrinoni (1925) found clinically an increase in the hepatic dullness in several cases of chronic encephalitis; in one case the liver was apparently diminished in volume. Some ascites was found in one instance.

No clinical evidence was found in any of our cases to suggest a disordered function of the liver. We have never met with jaundice, ascites, pallor of the stools, or abnormal areas of hepatic dullness in any case, either during or after the acute attack.

Histological Evidence.

Unfortunately, there is but scanty reference in the literature of epidemic encephalitis to the post-mortem appearance of the liver. This fact alone suggests that an absence of gross naked-eye changes in that organ is the rule; the evidence of macroscopic cirrhosis is sufficiently striking at an autopsy to invite comment and more detailed examination.

Reports as to the microscopic structure of the liver in these cases are even rarer, and most of the records at our disposal are the work of Italian physicians. In one fatal case of epidemic encephalitis, in which the patient died three weeks after the onset, Ada Harris (1921) reported œdema, cloudy swelling, and fatty degeneration in the liver. The blood-vessels were engorged, a few of them showing perivascular hæmorrhages. There were areas of necrosis around some of the interlobular vessels. Pierantoni (1923) recorded an autopsy on a man of 29, dying in a state of Parkinsonism of three and a half years' duration. The liver was found to be markedly cirrhotic; there was no previous history of syphilis or alcoholism. D'Alessandro (1924) also found vascular stasis and incipient fatty degeneration in the liver of a fatal case of encephalitis.

Rizzo (1924) found in the liver of one case, which perished on the fifteenth day, patchy colliquative degeneration of the parenchyma. The blood-vessels were congested, and here and there were traces of fatty degeneration. No evidence of connective tissue reaction was observed. In two cases of Parkinsonism in chronic encephalitis, of two and a half and three years' duration respectively, he found definite histological changes. Patchy colliquative rarefaction of the parenchyma was observed; in one case there was some venous congestion. Both cases exhibited a definite connective tissue reaction of fibroblastic and fibrous character.

We have had the opportunity of examining the liver in two fatal cases of encephalitis.

Liver 1.—M. N., male, aged 56 (patient of Dr. Gordon Holmes).

(Very advanced case of Parkinsonism following encephalitis; acute onset three and a half years previously.)

Naked Eye.—The liver was normal in size and consistency, and of smooth surface.

Histological.—On microscopical section the capsule appeared slightly thickened. There was a little increase in fibrous tissue in the portal spaces and between the cells. This cirrhosis was universal except in the case of the intercellular increase, which was patchy in distribution and but slight in degree. Associated with this connective tissue proliferation there was a small round-cell infiltration of the portal spaces. No cells were present between the liver cells or around the blood-vessels. There was no dilatation of the ducts or canaliculi. The majority of the cells appeared healthy; in some there were fatty changes, the fat being present in large globules staining brick red with Scharlach R. The nuclei remained intact and were deeply stained. There was perhaps some diminution in the number of Küpffer cells, which in many places appeared flattened against the sinus walls. Bile-pigment was seen in the cells and ducts.

Liver 2.—L. B., male, 5½ years (patient of Dr. Wilfred Pearson).

(Acute onset of encephalitis 12 months before death. Patient gradually passed into a stage of chronic nocturnal chorea with diurnal lethargy; stiffness of legs; dysphagia; mouth gaping widely; marked respiratory arrhythmia. Gradual onset of unconsciousness with head retraction before death.)

Naked Eye.—The liver was normal in size, shape, colour, and consistency. No surface irregularity was present, and there was no thickening of the capsule.

Histological.—In this case there was little or no increase in the amount of fibrous tissue in the portal spaces, and no pericellular fibrosis whatever. There was no round-cell

infiltration. The veins were slightly engorged; the great majority of the liver cells were normal, but in some occasional traces of fatty degeneration were detected; the fat was present in the form of very fine droplets, staining brick red with Scharlach R. No abnormality could be noted in the Küpffer cells.

These two livers afforded no evidence of impairment of any of the hepatic functions—secretory, excretory, glycogenic, or detoxicatory. The changes described are such as might be present in any fatal case of toxæmia, and there was nothing to suggest damage to any appreciable proportion of the liver cells.

Biochemical Evidence.

Various metabolic aspects of encephalitis have been studied, particularly by continental workers, who have concentrated upon the question of liver efficiency. In this country Ellis (1924) investigated the excretion of nitrogen and phosphorus in epidemic encephalitis. He found increased amounts of ammonia in the urine and an absence of phosphoric acid; in many cases albumosuria was encountered. He considered these changes to be due to intestinal or more probably liver derangement. Meyer-Bisch and Stern (1923) found urobilinuria in each of 11 cases of progressive encephalitis. Ingestion of 100 g. of lævulose caused lævulosuria in five out of six patients, together with an increased output of urobilin. They do not believe that the probable lesion of the liver was caused by the central nervous process. Xavier (1923) carried out hepatic efficiency tests on ten cases of chronic encephalitis; urobilinuria was present in one case. The Van den Bergh test was negative in each of five cases. Widal's hæmoclastic crisis gave a positive result in two patients, one of whom was advanced in pregnancy and the other had recently been treated with neo-salvarsan. The author concluded that there was no alteration in hepatic function.

Liver function has also been studied in 15 cases of Parkinsonism by Ottonello (1924). He found urobilinuria in six cases; urea excretion was diminished in all 15 cases, but there was an increased urinary output of ammonia nitrogen. In ten cases the urine failed to contain glycuronates after the administration of sodium salicylate. Alimentary glycosuria occurred five times. Ottonello concluded that defective liver function was a constant feature of chronic encephalitis.

The blood-sugar in this disease has been studied by de Giacomo (1924), who found a hyperglycæmia in every one of his eight cases. Pedrinoni (1925) performed liver function tests in 16 cases of chronic encephalitis; he found urobilinuria in 11, and in 10 cases uroerythrin was detected in the urine. The production of urea was below normal in all; indicanuria was found in every patient. The glycogenic function was normal in nine out of 14; the hæmoclastic crisis test was carried out 64 times, always with a positive result; the various components of the tests, however, were dissociated and incomplete. Halliday (1925) reports that in the acute stages of the disease the fasting level of the blood-sugar is normal; in some cases, however, the blood-sugar curves after the ingestion of glucose indicated a delay in liver storage.

Results in our Series of 34 Cases.

Out of the very numerous tests that have been suggested as indications of hepatic efficiency we have chosen for this present investigation five—namely, examination of the urine for bile-salts and pigments, the hæmoclastic crisis test, Van den Bergh's reaction, the lævulose curve, and Roger's test (examination of urine for presence of glycuronates after an injection of 5 gr. of camphor).

Bile-salts and Pigments in Urine.—This investigation was carried out on 33 patients with uniformly negative results.

Hæmoclastic Crisis.—Twenty-five patients were submitted to Widal's hæmoclastic crisis test; of these 12 gave a positive result. In nine of them the fall in the leucocyte count was 2000 or over. Eight patients gave equivocal results, and five were quite negative. In several patients a leucopenia was found at each examination; thus, counts of 4400, 3533, and 1633 were found in F. G., R. F., and A. McG. respectively.

Van den Bergh's Reaction.—This test was carried out on 13 patients with completely negative results.

The Lævulose Curve.—In 30 cases examined by this test, a resting blood-sugar level above 0·13 per cent. was found in all. In 21 cases the level lay between 0·14 per cent. and 0·18 per cent., and in two cases it lay higher than 0·2 per cent. The average reading for all the cases examined was 0·158 per cent.

After the administration of lævulose (25–35 g., according to patient's weight) a rise in the curve occurred in 23. The elevation varied in degree from 0·01 per cent. to 0·06 per cent.; and in time of appearance from 20 minutes to one hour: three cases gave a rise of 0·04 per cent.; three

Table showing Results of Tests in Epidemic Encephalitis.

Name.	Sex and age.	Duration (months).	Clinical state. P. = Parkinsonism.	Urinary bile-salts.	Urinary bile-pigments.	Roger's test.	Hæmoclastic crisis.	Lævulose test. R. = rise F. = fall.
LJ.	F 32	12	P.	0	0	+	+‡	R., 0·05 in 60′
CMcG.	F 24	24	P.	0	0	+	±	R., 0·01 in 45′
AW.	F 23	24	P.	0	0	+		
FM.*	M 24	12	P.; resp. disorder.	0	0	+	+	R., 0·02 in 30′
WC.	F 28	48	P.	0	0	+		
HH.	M 15	14	Slight P.	0	0	+	+	F., 0·02 in 30′
IT.	F 28	12	P.	0	0	+	0	R., 0·02 in 20′
WM.*	M 36	12	P.	0	0	+	0	R., 0·03 in 60′
ES.	M 19	13	Mild P.; resp. disorder.	0	0	+	+	R., 0·04 in 30′
IC.	F 23	12	P.; contractures; resp. disorder.	0	0	+	+	R., 0·06 in 60′
RF.	F 42	36	P.	0	0	+	+	
WE.	M 14	10	Torsion spasm; inverted sleep rhythm.	0	0	+	±	R., 0·02 in 30′
WR.	M 33	12	Severe P.	0	0	+		R., 0·02 in 30′
WW.	M 22	10	P.	0	0	+	±	F., 0·02 in 120′
CD.	M 30	12	P.	0	0	+	+	R., 0·01 in 20′
RF.	M 10	24	Moral change; inverted sleep rhythm.	0	0	+	0	F., 0·01 in 30′
GW.	F 32	48	P.	0	0	+		R., 0·02 in 20′
JK.	F 24	36	P.	0	0	+	+	F., 0·02 in 40′
LS.*	M 22	13	P.	0	0	+	±	No change.
AS.	F 41	10	P.	0	0	0		R., 0·04 in 40′
FG.	M 22	9	P.				±	R., 0·06 in 30′
AJ.	M 41	12	P.	0	0	+	0	R., 0·05 in 60′
CM.	M 40	7	Mild P.; chronic alcoholic.	0	0	+	±	R., 0·03 in 60′
LG.	F 26	12	P.	0	0	+	0	F., 0·02 in 30′
CP.	M 20	59	P.; moral change.	0	0	+		R., 0·03 in 60′
EB.	F 16	13	Myoclonus; resp. disorder.	0	0	+	±	R., 0·01 in 30′
TC.*	M 12	24	Mild P.; dysarthria.	0	0	+		R., 0·02 in 60′
FG.	M 22	18	P.	0	0	+	+	No change.
DS.*	M 35	36	Severe P.	0	0	+	+	R., 0·05 in 30′
ME.*	F 34	36	P.	0	0	+	+	R., 0·01 in 30′
WP.*	M 42	24	P.	0	0	+	±	R., 0·01 in 30′
CL.*	M 17	36	P.	0	0	+	+	R., 0·02 in 30′
GS.*	M 40	15	Slight P.	0	0	+		R., 0·04 in 30′
GR.*	12 20	F	Severe P.	0	0	+		

* Van den Bergh: 0. ‡ Weakly.

cases gave a rise of 0·05 per cent.; one case gave a rise of 0·06 per cent. In the others the rise lay between 0·01 per cent. and 0·03 per cent., which may probably be considered within normal limits. Owing to the variable kidney threshold for lævulose present in normal individuals, routine examinations for lævulosuria were not made. Two patients showed absolutely no change in the blood-sugar level after the ingestion of lævulose; in five others there was actually a fall of from 0·01 per cent. to 0·02 per cent., extending over a period of from 30 minutes to two hours.

Roger's Test.—In 32 cases glycuronic acid appeared in the urine after the administration of 5 gr. of camphor. In one case only was an abnormal reaction found, no glycuronates being detected by Tollen's reaction.

The value of these various tests is still disputed, and some of them—e.g., the pigmentary reactions—though genuine tests of hepatic function, are probably gross, a positive result indicating severe damage to the liver. It is possible that Roger's test and the lævulose curve are more delicate criteria of the slighter degrees of liver defect. The value of the hæmoclastic crisis test is still debatable, and there even is some evidence to suggest that it is worthless as a liver function test.

In our present series all the cruder pigmentary tests have been uniformly negative; of the more sensitive tests, such as Roger's, 32 out of 33 gave normal responses. The lævulose curves were, in 26 cases, within the limits of normality, although every one of the 33 cases examined had a high resting sugar. Seven cases showed a rise in the blood-sugar of from 0·04 per cent. to 0·06 per cent. The results in the hæmoclastic crisis test were certainly abnormal, but it must be pointed out that a leucopenia has been found in many of our control cases after the ingestion of milk, and hence no deductions are permissible from these results. It is worthy of note, moreover, that no parallelism could be traced between those cases showing elevation of the blood-sugar curve above 0·03 per cent. and those cases with a positive hæmoclastic crisis.

Discussion.

The subjects of these biochemical investigations have been patients exhibiting various sequelæ of epidemic encephalitis. Most of them were examples of Parkinsonism, but a few cases presented psychical changes without gross organic defects. The patients varied in age from 10 years to 42, and the intervals between the acute attack and the investigation ranged from seven months to five years. The accompanying table attempts to correlate clinical data with laboratory findings. The results of these investigations have broadly indicated: (1) that there is no biochemical evidence of any gross derangement in the functions of the liver, and (2) that in many cases the resting blood-sugar is increased.

The metabolism of glucose has attracted most attention in respect to its presence in the cerebro-spinal fluid in increased amounts. Although by no means a constant feature, nor yet confined to encephalitis only, nevertheless a "hyperglycorrhacie" is well known to be a frequent and striking phenomenon in both acute and chronic encephalitis. The figures obtained have never been very high, and have also been lower than the blood-sugar readings. Little attention has been given to the estimation of glucose in the blood in this disease. De Giacomo (1925) investigated this point in eight cases of Parkinsonism following encephalitis, and obtained in each case a definitely high figure; in five cases of senile paralysis agitans there was but a slight hyperglycæmia, which was inconstant in appearance.

During the acute stages of the disease, high blood-sugar readings have been recorded by Bourges, Foerster, and Moncandier (1920), and by Talheimer and Updegraff (1922). Normal results, however, were obtained by Foster (1921) and by Halliday (1925). From the estimations in our series it appears that a slight but definite increase in the amount of glucose in the fasting blood is of frequent occurrence. Thus all of our 31 cases have presented a mild hyperglycæmia. The average resting blood-sugar percentage for all cases has been 0·158 per cent. as opposed in 0·12 per cent. in our controls.

In spite of the definitely high amount of sugar in the resting blood, a lævulose meal produces as a rule no rise. Periodic estimations of the blood-sugar level after the ingestion of 30 g. of glucose produced in the majority of cases but little rise in the figure; the curve, moreover, rapidly "flattened out," and did not exhibit any striking deviation from the curves obtained in control cases. The cerebro-spinal fluid glucose after the ingestion of sugar was not estimated as a routine measure, but in one case in which repeated lumbar punctures were made at the same time as the blood was taken the two curves were seen to run parallel courses.

Although one of us in a previous paper has called attention to the presence in the urine of a Fehling-reducing substance in many cases of chronic encephalitis, in no instance in the present series has any constant glycosuria been observed. Two hypotheses have been suggested to explain the alterations in glucose metabolism in this disease; on the one hand, it has been supposed that the encephalitic virus has damaged various secretory elements in the extra-neural systems—in particular, the liver parenchyma. On the other hand, a derangement of the sympathetic system has been suspected. The present investigations fail to support any conception of a visceral origin for these changes. Thus our hepatic efficiency tests, though admittedly crude and of unproved value, do not suggest any obvious liver insufficiency. This has tallied with our clinical observations. Uranalysis, blood-pressure readings, and renal function tests, though not reported here, have not given evidence of any kidney derangement. We have found, moreover, a normal utilisation of glucose by the tissues, in spite of the elevation of the initial reading.

It appears, therefore, more reasonable to regard these metabolic changes as evidence of sympathetic involvement. It is improbable that an infection of the central nervous system, so diffuse in its activity, would spare the various sympathetic "centres" which probably lie in the diencephalon and along the base of the fourth ventricle and medulla oblongata. Clinical manifestations of altered sympathetic activity may be pointed out in such symptoms as seborrhœa, hyperhidrosis, and vaso-motor derangements.

Conclusions.

We have been unable to find any clinical, histological, or biochemical evidence to suggest an hepatic involvement after epidemic encephalitis. The amount of sugar in the resting blood, however, tends to lie at a slightly higher level than normal; it is suggested that this hyperglycæmia is the result of sympathetic dysfunction.

We beg to express our gratitude to the physicians of the National Hospital, upon whose patients these investigations were carried out.

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THE AVOIDANCE OF PAIN AFTER TONSILLECTOMY.

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IN the following article I have endeavoured to focus attention on one point only, the avoidance of pain after tonsillectomy. It may seem a comparatively small point, but in reality it is very important, especially from the patient's point of view. Everyone recognises that the unhealthy tonsil is one of the main portals for the entrance of infection, and one of the chief breeding grounds for micro-organisms. Complete removal of septic tonsils is recommended, with justification, for a great variety of pathological conditions, including enlarged glands of the neck, chronic rheumatism, anæmia, "neuritis," heart disease of toxic origin, chorea, epilepsy, persistent conjunctivitis, goitre, and many others. Septic tonsils in adults are more common than is often supposed, and are undoubtedly the cause of many obscure toxæmias; but if such a cause is to be discovered it must be looked for. The throat must be examined with two spatulas, one holding down the tongue, and a smaller one exerting steady pressure outwards and backwards on the anterior pillar of the fauces, causing the tonsil to emerge fully into view, and, when it is septic, squeezing pus out of it.

Many adult patients—and I find, nowadays, that in private practice, though not in hospital, I have to perform tonsillectomy more frequently for adults than for children—are inclined, however, to refuse operation on account of fear; they know of friends who were laid on their backs after the operation, in pain and unable to swallow, for ten days or more; or they expect to remain in a nursing home for a fortnight or longer, and cannot spare the time. It is therefore of great importance to be able to assure a patient that the operation can be performed painlessly, or practically so, and that he should be able to leave the nursing home quite well after three or four days. I admit that I have given this subject considerably more attention since I had my own tonsils enucleated, and have been able to realise personally the difference in comfort that attention to small and almost trivial details can make.

The question of whether a tonsil should be enucleated by the guillotine or by dissection may be considered from the same point of view. Dissection under a local anæsthetic is a method I have never employed; I have heard surgeons speak of it enthusiastically, but I have never yet known a patient do so. It may be painless at the time of operation, but it is certainly not so afterwards. At one time I used the guillotine invariably, employing the Whillis-Sluder method. I now prefer dissection, but I still frequently employ the guillotine for children with enlarged (but not with flat) tonsils; and in hospital "tonsil clinics" it must inevitably be employed if one is to get through a large number of cases in the time available. The guillotine method, however, does cause bruising of the fauces, by squeezing the tonsil through the aperture of the guillotine and then manipulating it against the mandibular eminence, and sometimes a piece of the anterior pillar must be removed in order to enucleate a flat tonsil completely.

The avoidance of bruising and tearing means the avoidance of subsequent pain. In adults, therefore, I invariably dissect out the tonsils, employing a technique which I have modified from a method I first saw employed by Dr. George Cathcart, and which has also some points of resemblance with the method popularised by Mr. G. E. Waugh. By this technique a minimum amount of damage is done to the throat, and the wound soon epithelialises; there is little or no bleeding; stitching is never necessary, and ligaturing of vessels seldom so; and patients tell me that they have no pain—at the worst they may have some discomfort while swallowing during the first few hours after the operation. The technique may be criticised as being an elaboration of what ought to be quite a simple operation, and as requiring a somewhat longer anæsthesia than is necessary for other methods of enucleating tonsils; but I feel quite certain that the good results which it invariably ensures, the prevention of bleeding, and the avoidance of pain, make it well worth while.

Before the Operation.

The steps taken to avoid pain after tonsillectomy begin on the day before the operation, in order to prevent vomiting by minimising acidosis; it is seldom that my patients vomit more than once as they are recovering from the anæsthetic, and many do not vomit at all. Bicarbonate of soda is given three or four times during the day, before food, three or four teaspoonfuls being dissolved in half a pint of water. A child may be given a stick or two of barley sugar to suck. It is also wise to give the adult patient 20 to 30 gr. of ammonium bromide at night, to ensure a quiet sleep on the night before the operation. On the morning of operation a simple enema is given, and the patient is not allowed anything to eat or drink before the operation, not even a cup of tea or a glass of water. The operation should always be fixed, if at all possible, for an early hour, 8.30 or 9 A.M. An injection of atropine, 1/100th gr., is given half an hour before.

At the Operation.

The anæsthetic I prefer is open ether, given with oxygen, and the induction may be begun with nitrous oxide. The patient is placed on his back with a sandbag under the shoulders, and the head is lowered and well extended on the neck. This brings the chin, middle line of the neck, and the sternum almost in a direct line, and the trachea therefore slopes downwards towards the post-nasal space, so that blood cannot get down it. A good big side-to-side bite of the tongue is taken with the tongue clip (personally I use a towel clip), and the tongue is held forwards by the anæsthetist, a pad of gauze being placed between the under surface of the tongue and the teeth.

The jaws are held apart with an ordinary Doyen gag protected with rubber tubing or with O'Malley's gag, being careful not to catch or squeeze the lips. It is worth while taking some care over the placing of the tongue-clip and the gag, as not infrequently the only complaint of pain a patient has made has been of the pain in the tongue or the lips. The operator sits at the head of the table, and the anæsthetist stands on his left. It is a considerable convenience for *both* to have forehead lights, so that at least one light is always focused on the area of operation. Before beginning, a few drops of castor oil are dropped into each eye, to protect them in case any blood runs down.

The Operation.

With a pair of long tenaculum forceps the mucous membrane is picked up about half-way down the outer border of the tonsil, internal to the anterior pillar of the fauces, and as close as is conveniently possible to the tonsil. With a pair of long, straight, sharp-pointed scissors (those I use are 8½ inches long, and were specially made for me by Messrs. Mayer and Phelps) a cut is made into the mucous membrane which has been picked up, exposing the white capsule of the tonsil; the cut is continued first upwards towards the tongue, and then downwards towards the soft palate, round the border of the tonsil. The tonsil is then gently pulled forwards and outwards, and the cut is continued upwards again behind, separating the posterior pillar of the fauces from the tonsil. The operator must be careful merely to expose the capsule of the tonsil all round, and not to cut into it.

With a pair of Waugh's dissecting forceps a strip of gauze is introduced where the incision was begun, and pushed down and round between the tonsil and the anterior and posterior pillars, and then

behind, wiping the tonsil in its capsule out of its bed. The tonsil is held at first with the other pair of forceps and then, as it comes farther out, with a volsellum. The dissection is done very gently and quite slowly; there is then little if any bleeding, and any troublesome vessel is secured at once with a pair of long artery forceps, which will stop the bleeding if left on for a minute or two. When the tonsil is free except for its lingual prolongation, this is clamped across with a pair of Birkett's artery forceps, and then cut off with blunt-pointed scissors; the artery forceps are left on for a minute or two to prevent any bleeding. A piece of gauze is then squeezed out of turpentine (as suggested to me—though it is an old-fashioned styptic—by Mr. Harold Kisch), packed into a tonsil bed, and held firmly there for a short time; this acts not only as a hæmostatic, but as an antiseptic, and lessens sloughing afterwards. A pad of dry gauze or cotton-wool is left in the tonsil bed, while the other tonsil is being enucleated in the same way.

When the tonsil is gently dissected out in this manner there should not be any bleeding to trouble about. I no longer apply ligatures, as I found that ligatures in the tonsil bed caused a good deal of discomfort to the patient afterwards. A few minutes devoted to waiting until bleeding has stopped, after securing the bleeding point or points with long artery forceps, will obviate the necessity for any ligatures, although I always have linen thread ligatures ready on my instrument table in case of unexpected trouble. The mucous membrane is cut all round close to the tonsil so as to preserve as much mucous membrane as one can, and to leave as small a wound as possible; instead of the wound being left gaping the mucous membrane forms a rounded border to it, and from its edge epithelialisation over the surface of the tonsil bed soon takes place, without any contraction.

After both tonsils have been removed, the throat, mouth, and tongue are cleansed of blood with warm saline solution, and any blood clot removed from the post-nasal space. A last careful inspection is made of the tonsil beds, to make sure that no bleeding point has been overlooked, before the patient is put back to bed.

After the Operation.

When the patient begins to come round I give him a hypodermic injection of heroin, ⅛ gr., or omnopon, ½ gr.; a child is given aspirin 10 gr. and potassium bromide 10 gr. per rectum or by the mouth. This gets him comfortably through the greater part of the day. When he has recovered from the effects of this, in the early afternoon, I spray the throat and all round the mouth with glycothymoline and warm water, half and half. I also give the patient an aspirin "throat bath," as Dr. Georges Portmann calls it: 10 gr. of aspirin powder is flung on the surface of half a tumbler of warm water, and before the aspirin has begun to dissolve it is held in the throat, first on one side and then on the other, as if the patient were going to gargle, but without gargling, which would hurt the throat. The aspirin powder thus gets right into the tonsil beds, where it has a very soothing effect. The patient should maintain complete silence. If he must speak at all he should speak in a whisper only, so that the sides of the fauces are not brought into play.

At tea-time, and again later in the evening, the patient may have some ice cream, or if he prefers he may drink some lemon-water or barley-water; but for the first 24 hours he should not drink very much, as swallowing may be uncomfortable. The glycothymoline sprays are continued every hour or two, the aspirin throat baths three or four times daily. At night the patient may be given aspirin, 10 gr., with potassium or ammonium bromide, 10 gr.; but he often settles down to sleep without any sedative.

Having got the patient comfortably through the first 24 hours he usually complains very little, if at all, of discomfort afterwards. He must keep as silent as possible for the next two days, speaking only in a whisper. The glycothymoline sprays and the aspirin throat baths are continued regularly every few hours as long as he is in the nursing home. An aspirin throat bath, or, as time goes on, an aspirin gargle should always be given immediately before a meal, and the food can then be swallowed without discomfort. On the second day the food should consist of bread and milk, custards, junkets, ice cream, jellies, tinned pears (which are the most easily swallowed fruit), and he may have barley-water and similar drinks. Milk must not be given, as it gets sticky and uncomfortable in the throat.

On the third day he may have, in addition, some fish or chicken. This should not, however, be pounded up into so-called fish or chicken creams; when prepared in this manner little particles get into the tonsil beds and cause considerable irritation. The patient should get out of bed on the third day, and may also have bread and butter, tea, or fruit. On the fourth day he should be able to eat ordinary food and drink ordinary drinks. He should be able to go home on that day or the next, and should begin to use his voice in the ordinary way, but without tiring it. Singers should begin to practise again at once, to assist in preventing any contraction of the pillars of the fauces.

Medical Societies.

ROYAL SOCIETY OF MEDICINE.

SECTIONS OF DERMATOLOGY AND STUDY OF DISEASE IN CHILDREN.

A COMBINED meeting of these Sections was held on Dec. 17th, Dr. J. H. SEQUEIRA, President of the Section of Dermatology, being in the chair, when Dr. A. M. H. GRAY opened a discussion on the

Ætiology and Treatment of Infantile Eczema.

He confined himself to those varieties of eczema which attacked the face, dividing them into three classes: (1) those starting on the cheek or forehead, (2) those starting on the scalp, (3) those occurring in association with a general eczema starting on the body. In the first class an intensely itchy patch was usually followed by urticarial or erythematous lesions, not resembling bacterial infection. The prominent parts of the face suffered more than the hollows, suggesting that friction played an important part. Most of the infants were breast-fed, fat, and healthy looking. The second type often followed the rubbing of scurfy patches, and the face, when involved, usually broke out suddenly, suggesting a sudden breaking down of skin resistance rather than a spreading local infection. The type of the eruptions seemed much the same in all groups, and the clinical features depended more on the nutrition of the patient and the stage of the disease than on its place of origin.

The Underlying Diathesis.—In 40 cases of eczema seen at Great Ormond-street, 24 were of type (1), and of these ten subsequently developed asthma or recurring bronchitis; eight were of type (2) and six of type (3), and in these no chest trouble was reported. Thus it seemed that the primary facial cases had some specialised form of hypersensitiveness which was not present in the others which had only that form of acquired hypersensitiveness met with in adult eczema. The figures also supported the view that most scalp cases were infective or "seborrhœic." Five of the facial cases gave some history of recurrent rash, but always on the cheek, and there was no flexural eczema. Possibly that would develop later, as a large number of adults suffering from this gave histories of infantile facial eczema and asthma. Cyclical vomiting and hay fever had also been associated with these conditions, and the speaker was convinced that infantile eczema was one expression of an underlying diathesis which did not cease when the facial eruption got well.

Death in Eczema.—Five of the 40 children had died, one from encephalitis lethargica in later life, the

others all in infancy from epidemic diarrhœa, empyema following multiple boils, and convulsions. The latter was in a scalp case and was the only one that raised the question of "eczema death."

Exciting Cause.—Some definite cause could usually be found for the primary eruption; in the scalp cases a bacterial infection was the starting-point but the facial cases were less easy to account for. Protein sensitiveness and digestive disturbance were the two theories. Most cases occurred in breast-fed children, so any protein-irritant must come from the mother's milk, but cutaneous tests with human milk had been extraordinarily inconclusive. It might be that the offending protein had been ingested by the mother and was not necessarily present at the time of testing. Several observers had found a tendency in eczema patients of all ages to give positive cutireactions to two, three, or more proteins, which suggested that the hypersensitiveness was not specific in infantile facial eczema. Recently certain observers had thought that different clinical types of eczema could be associated with indigestion of sugar, starch, and fat respectively. Nevertheless, as Towle and Talbot had pointed out, so many infants with indigestion of fats and sugars presented no skin lesion that there must still be some underlying condition. A large number of cases showed symptoms of overfeeding and improved considerably when the quantity of food was reduced. It seemed probable that indigestion might cause flushing and itching of the face and that the subsequent rubbing would produce in the child with a diathesis the chain of symptoms included in the primary face type.

Treatment.—The main point was to stop friction, and this could only be partially done by restraint. Change of temperature was the most potent cause of itching and should be avoided as far as possible. In non-septic cases zinc paste formed the best basis; in septic cases starch and boric acid or flavine poultices. Crude coal-tar was far the best antipruritic, and could be used on a face-mask, 3 per cent. coal-tar in Lassar's paste, with good results. No definite improvement followed the use of drugs, though bromide was sometimes useful, and reduction in the feeds was the only dietetic measure necessary. In early scalp cases sulphur and salicylic ointment was valuable.

The Problem of Idiosyncrasy.

Dr. H. C. CAMERON limited his remarks to the problem of what underlay the idiosyncrasy of particular infants to produce their tendency to eczema. How were we to explain the regularity with which an attack of measles would clear the skin absolutely and instantly of eczema? the curious association between vaccination and eczema? the risk of implanting a generalised vaccinia in an eczematous patch? He had seen one eczematous child who took chicken-pox perfectly normally. The "eczema death" might be septicæmic or due to interference with the respiratory function of the skin by the excessive use of ointments and bandages. Most of the fatal cases died with hyperpyrexia.

On the whole, the eczematous child was one who readily retained water in the tissues; it put on weight very fast and appeared very fit with a high colour, but was really an atrophic infant with the atrophy masked by the water, which might suddenly be turned out with great loss of weight. Judged by what they could do these children were not healthy. Eczema might be put into two groups: (1) that occurring in the very young, thin baby, a generalised form, and (2) that occurring in the older, fat child, on the cheeks. By fattening the first class and making the second thin the eczema would be cleared up. Many eczematous babies were spasmophiliac with a low calcium content in the blood and a tendency especially to tetany and laryngismus stridulus, and even when there were no gross manifestations the "latent signs" could very often be found in the eczematous baby. There were three conditions in which sudden inexplicable death might occur in the young child—eczema, spasmophilia, and status lymphaticus. Status lymphaticus was the post-mortem equivalent of the clinically hypolabile child, and these children had often had eczema during life. If such a child died a slow lingering death with dehydration there would be no trace of lymphoid hyperplasia post mortem. The eczematous diathesis of Czerny was the clinical analogue of status lymphaticus. In older children there were two diatheses (and in both a history of infantile eczema was often found). One was the type of child with a high lymph content in the body, an ill-defined margin to the hairy scalp, and an inveterate tendency to impetigo and chronic mucous catarrh of the lung and bowel; if there was a secondary infection with tuberculosis, as often happened, this type became the "scrofulous child." Czerny had written volumes on the ill-effect of milk in such children. The second was the intellectual, meagre, thin child, exhausting itself by the energy it put into everything, suffering from vasomotor troubles, pallor, prostration, and abdominal discomfort passing into cyclical vomiting. This child's condition was improved by cutting out milk-fat; on a high fat content in the diet they did badly and got acetonæmia, smelly breath, furred tongue, and constipation. There seemed to be some connexion between eczema and a milk diet; if the eczematous infant of 7–8 months were put on to a mixed diet with the minimum of milk it was much improved. The "diaper rash" was due to ammoniacal urine and could be put right by large doses of alkalies. Finkelstein had tried the substitution of his albumin milk, a high concentration of casein with reduction of whey and salt, and had been successful with the fat, watery infant but not with the thin type. In spite of the importance of breast-feeding, supplementary or mixed feeding was the right treatment for eczema.

Discussion.

Dr. H. G. ADAMSON defined infantile eczema as an eruption starting on the scalp, both cheeks and forehead, avoiding the orbits, nose, and mouth with a characteristic mask-like distribution. Usually, sooner or later, it involved the outer surfaces of the forearms and legs and sometimes the trunk. It consisted of circumscribed red areas covered with minute weeping points. The whole thickness of the skin was swollen to two or three times its normal. There was intense itching, which aggravated the condition. With careful protection from irritation it subsided and might never recur. If not cured in infancy it might last into childhood or adult life. A small percentage of uncured cases developed asthma in conjunction with the chronic eczema of childhood, but cured cases did not. Pathologically, it was a catarrhal inflammation characterised by serous exudation into the whole thickness of the skin. His experience was that it was quite independent of any digestive disturbance or food idiosyncrasy and was never influenced by dietetic measures. He inclined to the view that external irritants were the sole factor. It started on the parts exposed to changes of temperature, imperfect drying, and contact with the perspiring skin of the mother. Sudden change of temperature would produce flushing, and the irritation would lead to a dermatitis and finally an eczema. When the skin had become eczematised it became hypersensitive in other parts. Ninety-five per cent. of Dr. Arthur Hall's cases began in winter. Scalp cases always followed on scurf. The only fact against a purely external ætiology was the occasional association of eczema and asthma, but eczema might attack only one child in a family, or one of twins, and could be cured only by external treatment. Sudden death was very rare and probably due to chill, as in burns.

Prof. F. S. LANGMEAD said that the term "eczema" included many conditions—traumatic lesions, lesions due to heat, cold and vascular disturbance, and diseases of the nerves. It was a satisfying word, but if translated into English as "a weeping" or a subacute catarrhal dermatitis would be less satisfying and less likely to interfere with progress in discovering

its cause. Irritants causing it included soap, wind, heat, scratching, &c.; excretions, stools, and urine: discharges; bacterial infections and irritations from within, sweat, and possibly blood. The eczema beginning about the buttocks of small babies was due to irritant excretions, especially ammoniacal fæces, and should not be treated purely as an external condition. These children took carbohydrate badly and the stool could be made alkaline by giving excess of protein; this was one of the best uses of a whole milk diet. Another type was the facial eczema, spreading over the body, in the well-nourished child with the full-moon face. It was in these that the sudden death occasionally happened. Probably there was some underlying constitutional factor in this class. A third group was associated with a protein idiopathy and the protein reactions of these should be explored. Epileptic convulsions might be heralded by a patch of eczema. In treatment something could be done with alkalies and a great deal with calcium lactate, especially if combined with parathyroid.

Dr. J. M. H. MACLEOD said that eczema was not a disease but a type of reaction; in the infant it was pure and more easily studied than in the adult. It was a local condition produced by scratching and rubbing. Temperature was an important factor; the majority of cases occurred in winter and yet gastro-intestinal disturbances were much commoner in the summer. He had never known it definitely produced by diet. It was extremely rare on the buttocks, which were subject rather to a papular urticaria or streptococcal infection. As soon as the local reaction had been produced the skin became hypersensitive all over and reacted more readily to minor irritants. The line to take was to concentrate on avoiding things that made the child scratch.

Dr. G. H. LANCASHIRE said that the majority of cases were simply the expression of a skin sensitive to external irritation, which was the only factor common to all cases. When the child was again exposed the eczema reappeared. In many cases the skin was in a neglected condition and must be cleansed first of all with starch-boric poultices, &c. Coal-tar was most useful; he preferred a 5–6 per cent. preparation with starch, vaseline, and zinc oxide. Much depended on the quality of the coal-tar. Death might be due to injudicious dressing with cold evaporating lotions.

Dr. H. HALDIN-DAVIS said that injudicious feeding might lead to scurfy lesions and spots, which would get better when the diet was put right, but the eczema with which dermatologists had to deal was a much more severe thing and could not be treated by diet or medicine. Protection and antipruritic measures were the sheet-anchor of treatment. We did not yet know enough to say what the constitutional defect was that underlay it. He had found that in some cases there was excess of sugar in the blood, and that the blood-sugar curve after a glucose meal showed a "sugar lag."

Dr. J. MURRAY BLIGH said that there was a local belief in Lancashire that if you got rid of the eczema too quickly the child died. There seemed to be something in this idea; pneumonia had some part in most of the fatalities. He had never seen eczema of the buttocks. The worst cases did not occur among the poor. For treatment a good nurse who could keep olive oil constantly applied to the whole body was the first essential. Three layers of butter muslin saturated with the best oil obtainable should be kept on the child and chloretone given to keep it quiet. Alkalies should be given as a routine because the children always developed another non-eczematous rash on the buttock. By this means the condition could be cured in about six weeks without change of diet. He was not satisfied that taking the baby off the breast had ever helped.

Mr. FRANK COKE said that he had obtained a history of eczema in 18 per cent. of his cases of asthma. Of 1000 cases, 225 were sensitive to food proteins, and in this group 37 per cent. had had eczema. He thought that wheat-sensitiveness played a large part. Eczema could be cured by a diet free from substances to which the patient was sensitive. On the face it was often due to sleeping on a feather pillow. Manganese and calcium cleared it up and kept it cleared.

Dr. S. E. DORE said that the seborrhœic type might be due to direct infection from the mother brushing her hair over the child. This could be cured locally. Thyroid was beneficial in some cases. He would divide eczema into (1) simple or traumatic, due to the infant's own secretions, and (2) seborrhœic—a very large percentage.

Dr. M. S. THOMSON said that the insomnia and exhaustion resulting from eczema upset the digestion, and the eczema could not then be cured until this was attended to. Hypnotics might be given more; chloral and potassium bromide was very useful. He did not see how the irritation theory could explain the sudden acute eczema in flexures. He had not seen cyclical vomiting associated with eczema, but he had with lichen urticatus.

HUNTERIAN SOCIETY.

THE second dinner meeting of the Hunterian Society was held on Dec. 14th at Simpson's Restaurant, with Dr. HOWARD HUMPHRIS, the President, in the chair. After dinner Dr. CAMPBELL MCCLURE opened a discussion on

INDIGESTION.

He said he would define indigestion, for the purpose of these remarks, as symptoms more or less connected with the upper abdomen and due to disorders of the stomach and intestines. Good functioning depended on two things, motility and secretion; but the stomach and bowels could either move too fast or too slowly and their secretions could be in excess or deficient, and all indigestion was due to one or other of these causes. The commonest initial symptoms were nausea, and pain varying between trivial and acute, in the upper abdomen. Pain in the epigastrium did not necessarily connote a severe lesion, but nevertheless called for careful observation, since there was a tendency for pains seated in remote parts of the abdomen to be referred to the epigastric region. Pain caused by pressure on the pylorus was referred to the middle line, slightly to the right, near the xiphisternum; that of gall-stones to the region of the ninth rib; and that of appendicitis to McBurney's point. A symptom of duodenal ulcer was severe gastric pain, and bad stomach-ache was also one of the signs of appendicitis, cervicitis uteri, and (in children) phimosis.

Difficulties of Diagnosis.

Apparent indigestion might, therefore, have nothing to do with the stomach, and the real trouble was often extremely hard to diagnose. Even after a close clinical examination the physician had to seek the help of the radiologist and the chemist, and even these experts might not be much more accurate than the clinician. Since the symptoms of pyloric and gastric cancer could both be produced by minor conditions, the necessity for close observation and reasoning was obvious. Many physicians tended nowadays to rely far too much on aids to diagnosis and did not think enough for themselves. Incredible though it might seem, there were still practitioners who left low corsets and underclothes in place when they examined an indigestion patient, and he had recently had three patients sent to him for indigestion, one of whom had an abdominal aneurysm and two acute appendicitis. These were bad examples of faulty examination. Moreover, X rays could rarely tell the clinician more about a case of indigestion than he knew himself, and for some radiologists the barium shadow had a fatal fascination. They would follow the advancing meal carefully down into the intestines and neglect the empty parts that it had left, and sometimes report

free from organic disease a patient who suffered from functional dilatation of the stomach and duodenum and from pyloric spasm, whose cardia could be found by percussion right up to the fifth interspace well after the meal and who had been suffering from severe pain and tachycardia. Surgical interference would be disastrous to cases of this kind, and it was quite wrong to say that the physician cannot diagnose them.

Chronic Dyspepsia and the Long Stomach.

Graver forms of indigestion were due to gross lesions. Gastric ulcer, for instance, was a serious and painful condition that sometimes led to deformity such as the hour-glass stomach, and often called for surgical interference. In the many cases where the trouble came on without warning it was obvious that some factor was at work beyond mere irritation of the mucous membranes by unsuitable food. One man could eat and drink his fill for a long lifetime, another suffered from dyspepsia as a youth and died early; one would break down gastrically from worry and another would escape. In his opinion many of these cases suffered from a long stomach and a redundant colon from the day they were born. A long muscle lost tone more easily than a short one, and a long stomach, although it gave no trouble under good conditions, lost its tone directly the system encountered strain. Dyspeptics were nearly always deficient in calcium and their vitality was low; they were easily exhausted and fell ready victims to infection, which had a severe and rapid effect on the alimentary system and was often the cause of ulcers. This type of constitution was badly equipped from the start and when it came under stress the sympathetic system was liable to get out of hand. This lack of nervous control might depend on a lack of endocrine balance. The trouble was sometimes a failure to assimilate certain substances and sometimes a failure to eliminate others. The bulk of the treatment must be medical and not surgical. Admittedly gross lesions should be handed over to the surgeon, but after the operation they should be returned to the physician so that he could correct the remaining faults and obviate the danger of a relapse.

The Surgeon's Part in Diagnosis.

Mr. H. W. CARSON, in opening the discussion from the surgical side, said that he was cheered by Dr. McClure's ready admission that surgery had a definite place in the treatment of indigestion. When he first went to St. Bartholomew's Hospital the number of abdominal operations performed in a year was not more than 30, and none of these had as its object the cure of indigestion. In his last year the figure was 96, of which only nine were for other complaints. The mortality at first was 70 per cent., and it spoke highly for the courage of the surgeons that they carried on in the face of this tremendous mortality until they reached the firm ground on which they now stood.

The surgeon was not a mere carpenter, diagnosis was an important part of his work. His power had been enormously increased by the fortunate advent of radiology and biochemistry soon after he began to deal with the problem of indigestion. It was now possible to say fairly accurately in any given case what had happened, but our knowledge about causation was still almost negligible. The nose, teeth, tonsils, and other potential foci of sepsis had long been suspect, but a more recent object of suspicion was food. There was no doubt that indigestion was on the increase, and it was very probable that the cause was the present faulty method of preserving food. Hardly any food escaped manipulation in some way; eggs were always suspect and milk was known to be very dangerous. Unfortunately, almost any attempt to improve the milk-supply immediately became the subject of acute political controversy and was blocked at the outset.

The most important kind of indigestion from the surgeon's point of view was that caused by gastric and duodenal ulcers. If it were true that the surgeon had no part in the treatment of any but chronic and recurring cases, the physician must claim the power of curing these ulcers, but the hospitals were packed with dyspeptics who had refused to get well and had been "thrown to the lions" for them to do their best. Duodenal ulcer was now treated by gastro-jejunostomy, often with appendicectomy and the removal of any causes of sepsis. 85 per cent. were cured, but the remainder became definitely worse, as some types of duodenal ulcer persisted in spite of gastro-jejunostomy. It was time, he thought, to ask whether the present method had not better be replaced by duodenectomy, which had a mortality of 10 per cent. but gave a positive result in the remainder.

Operations for gastric ulcer tended to become more and more radical. Results had been very poor except when the ulcer had been separated close to the pylorus, and the question arose whether gastric ulcer was not the first stage of a potential gastric cancer. The bulk of the evidence was certainly against this theory, but it underlay most of the partial gastrectomies of to-day. Whether the policy was justified only time could show. It was wrong to regard gastric and duodenal ulcers as fortuitous conditions, to be treated as well as possible. They were stages in a long course of toxæmia, which was not necessarily ended by operation, and they still required long and careful treatment after they left the surgeon's hands. It had been once believed that brain workers were especially liable to angina pectoris, but they were now known to suffer chiefly from duodenal ulcer. It was highly probable that many diagnoses of angina pectoris had been wrong, and that the pain felt near the heart was referred from the duodenum. Many physicians maintained that gall-stones were a medical complaint and could be cured by medical treatment. This belief was quite unjustified, for only surgery could remove them. It was, moreover, highly dangerous to delay the operation, as many cases showed serious complications. The difficulty lay in diagnosis, and none of the promised tests had given more than 15 per cent. of results. It was not possible to attempt a radical cure in more than 20 per cent. of cases of cancer of the stomach or 40 per cent. in cancer of the colon. Nearly all the cases that came to him had advanced growths in the stomach or obstruction of the colon, and this was because the early signs of this condition were not known, or at any rate not taught. The diagnosis was not difficult, and the fact that they escaped diagnosis was simply due to ignorance. One of the pitfalls of surgery was the right-sided abdominal pain. The origin was nearly always obscure and the surgical results disappointing. In spite of the surgeon's definite knowledge that appendicitis pain was always referred to the epigastrium, a pain in the right iliac fossa always seemed to attract him irresistibly to the appendix. Tenderness at the right iliac fossa was a reliable sign, but not pain. Diagnosis of appendicitis should never be made until the patient had had a severe attack, and certainly not on the right iliac fossa pains alone. In visceroptosis the scope of surgery was becoming more and more confined. The stomachs of many healthy people came below the umbilicus and their colons below the pelvic brim, and many had been made invalids by indiscriminate fixation. Every organ must have latitude, and it was better to cut loose structures that were normally fixed than to fix structures that were normally loose.

The Vicious Circle of Fear.

Dr. H. CRICHTON-MILLER spoke of the vicious circle of fear and its effect on dyspepsia. When there was a possibility of grave and secret conditions the patient frequently gave way to great psychic exaggerations, and before we assessed the symptoms we should discount those that can be removed by reassurance and reason. A great many patients feared heart disease and a great many insomnia, which might come from visceral pains, heart pains, or nightmare. He protested against the habit of giving hot milk to dyspeptic patients for insomnia. They were totally unable to digest it, and inevitably woke up with pain due to

fermentation and distension. Fear of the return of pain or hæmatemesis prevented us both from digesting and from seeing straight, and thus established the vicious circle. Any shock suspended the gastric processes, and could also be interpreted in terms of fear. It brought the mechanism of the adrenal into play and threw out the balance of the sympathetic and parasympathetic systems and affected either the secretory or the motor functions of the stomach. Atonicity did not depend upon any particular organ, and could only be remedied by patience. The mechanism by which fear generated wind was that the prolonged suspense caused prolonged inhibition of the adrenal secretion and therefore a vagotonic condition. During that time dilatation and fermentation were taking place. When the effort was over a sympathetico-tonic reaction occurred which compressed all the unstriped muscles and expelled the wind. Everything that made for emotional poise promoted good digestion, and all psychological methods had their value; sometimes mere reassurance was enough to break the vicious circle. The speaker deprecated the practice of dieting the dyspeptic as though he were a diabetic or a nephritic, and recommended that the patient should be encouraged to think for himself and help to work out his own dietary scheme. No group of diseases was so susceptible to "spiritual" healing as the dyspeptic group. Much quack healing flourished because a patient would give up self-pity in exchange for self-importance, which was stimulated by ceremonial and elaborate treatment, but this principle was thoroughly unsound.

Discussion.

Dr. A. C. JORDAN mentioned the alimentary health of certain Indian hill tribes and indicted as the cause of indigestion civilisation and the introduction of sugar and manipulated foods. That the colon especially had suffered much from highly refined cereals was shown by X rays. Chronic neuritis was one of the sequelæ of chronic dyspepsia.

Dr. D. M. BARCROFT pleaded for some system of adequate treatment. Alkalies were mere palliatives; the patient was probably not secreting the right kind of fluid in the stomach, but the practitioner did not know when to supply diastase, pepsin, or acid. The last-named often gravely increased the symptoms. He recommended suitable exercise and general hygiene to raise the tone.

Dr. E. YOUNG stated that in his experience nausea was a very unusual symptom. He did not agree that a gall-stone patient should be immediately sent to the surgeon; if he were free from symptoms after medical treatment he should not be subjected to the risk of operation. The large quantities of undigested starch often found in the fæces of dyspeptics showed the prevalence of dietetic error. Hot water and bicarbonate of soda were a better night-cap than milk.

Dr. MCCLURE pointed out, in reply to Dr. Crichton-Miller, that fear was first felt in the epigastrium and that flatulence and dilatation of the stomach were its early signs; the first thing to do, therefore, was to get the stomach right. Psychotherapy was as valuable for correcting misinterpretation of symptoms as it was in definite mental disturbance.

LONDON ASSOCIATION OF MEDICAL WOMEN'S FEDERATION.

A MEETING of this Association was held on Dec. 8th at the house of the British Medical Association, Dr. CHRISTINE MURRELL, the President, being in the chair, when Dr. MARJORIE BLANDY read the paper on

Recognition of Early Nervous Disease,

which appeared in full in the last issue of THE LANCET.

Dr. HELEN BOYLE deplored the attempt to segregate into different hospitals cases of organic nervous disease and those of early mental disorder. The nervous system could not be split up; it should be regarded as a whole, since the separation of neurological and psychological factors could not in any case be attained. She was convinced that every mental hospital contained many cases suffering from encephalitis not necessarily encephalitis lethargica, but the form which might follow influenza or toxic disease.

Dr. ELEANOR LOWRY suggested that those cases with subjective olfactory symptoms should have the antra transilluminated to exclude local disease.

Dr. IRENE YATES spoke of the difficulty in diagnosing early disseminated sclerosis. Plantar response was difficult to obtain in the out-patient department.

In reply, Dr. BLANDY said that a true ankle clonus was pathognomonic of nervous disease, and if that were obtained it mattered less about the plantar response. She always contrived to warm the patient's feet by some means before testing their plantar response.

Dr. ELEANOR SCARBOROUGH read a paper on the influence of

Thyroid Feeding on Chronic Morphine Poisoning,

in which she described experiments on albino rats designed: (1) to combine thyroid feeding with chronic morphine poisoning, and to compare the susceptibility of rats to morphine with that of rats under the same doses of morphine without thyroid feeding. (2) To compare, during life, the influence of morphine, with and without thyroid feeding on the behaviour, body-weight, and temperature of the rats, and on the condition of the skin appendages; also, post mortem to compare the weights of certain organs and the structure of the thyroid glands. (3) To examine these results in relation to the various hypotheses which have been put forward to explain the relation between the activities of the thyroid gland and morphine poisoning.

She described the experiments in detail and gave the following summary of results obtained: (1) Chronic morphine poisoning when associated with thyroid feeding is not accompanied by any accentuation of the depressant action of morphine on the central nervous system, but rather by an increase in the signs of excitement of the cord. (2) The metabolic effects produced by combined morphine poisoning and thyroid feeding are more marked than those produced by either drug alone, and resemble the effects of pronounced hyperthyroidism. (3) The weights of organs concerned in metabolism are low in chronic morphine poisoning. The combination of chronic morphine poisoning with thyroid feeding tends to check the hypertrophy of these organs which otherwise accompanies thyroid feeding. (4) Chronic morphine poisoning is not associated with any change in the structure of the thyroid gland.

BRIGHTON AND SUSSEX MEDICO-CHIRURGICAL SOCIETY.

A MEETING of this Society was held on Dec. 3rd, Mr. H. J. WALKER, the President, in the chair, when Mr. HAROLD F. SEYMOUR read a paper on

Some Recent Methods of Investigating the Patency of the Fallopian Tubes in Sterility.

Mr. Seymour said that it was only within the last two or three years that a technique had been worked out which satisfactorily showed whether the tubes were blocked or not. After mentioning the various contra-indications, he described these methods. (1) That of Dr. Rubin, of New York: The injection of carbon dioxide gas through a uterine cannula, the pressure of the gas being indicated by a manometer. The apparatus was fully described and shown. The advantage of carbon dioxide over air was that the former was absorbed so much more rapidly and consequently it was more comfortable from the patient's point of view. Mr. Seymour commended the water

displacement meter used by Rubin as it allowed the gas to flow very gently. (2) Mr. Victor Bonney's simple method of using air was referred to. (3) Demonstrations given to the speaker by Mr. Sidney Forsdike at the Soho Hospital for Women were described—the method of injecting air through a hollow uterine dilator. By any of these means, Mr. Seymour said, it was an easy clinical test to determine if there was a free passage through the tubes or not, a test which had now become a recognised gynæcological procedure. That insufflation of the tubes had a therapeutic effect, as well as a diagnostic side, was illustrated by one of Mr. Seymour's cases. A woman, of 32, married for three years, having had no children, desired a child and sought advice. She suffered from dysmenorrhœa and had retroflexion of the uterus. A round ligament shortening operation was done curing the retroflexion and the dysmenorrhœa. A year after the operation, as she had not become pregnant, her tubes were tested and the gas did not run away at 100 mm. pressure as it did in patent tubes, but mounted to between 150 mm. and 160 mm. before it began to run off, which showed a partial block. This patient has now a healthy child, having become pregnant immediately subsequent to the gas inflation. Some of Rubin's figures were given, further illustrating this therapeutic effect.

When the tubes were shown to be blocked the next procedure was to localise the block in collaboration with the radiologist. The methods employed were as follows: (1) Injections of lipiodol, as performed by Mr. Forsdike. Lantern slides of eight cases were shown illustrating this method. (2) Injections of barium sulphate emulsion into the body of the uterus. Mr. Seymour preferred Rubin's apparatus for diagnosing the block and Forsdike's lipiodol method for locating the position of the block.

Mr. Seymour then read a short paper on the possibilities of

Endoscopy of the Uterus.

and described his own hysteroscope. He said that for some months he had been experimenting with various means of examining the cavity of the uterus endoscopically under anæsthesia after dilating the cervix. A hysteroscope, made after the style of Chevalier Jackson's bronchoscope, with two suction tubes and the light at the distal end, had given very good results. The suction tubes rapidly removed any blood and mucus which obscured the view. A Mennell's electric vacuum pump was used for suction and the instrument was made in two sizes, one with a bore of 6 mm. and the other with a bore of 9 mm., the length of the tube being 28 cm. With a special pair of forceps a snipping of any growth seen could be removed for microscopic examination.

Mr. Seymour considered that endoscopy of the uterus was going to be useful as an aid to diagnosis of the various kinds of endometritis and to differentiate between a submucous fibromyoma and a carcinoma. It was easy to see a polypus up in the fundus and the opening of the tubes could be viewed. Diagnostic curettage was far from satisfactory, and endoscopy would, he thought, eventually supersede it.

Discussion.

Mr. H. J. MCCURRICH emphasised the unsatisfactory results from the point of view of diagnosis obtained by curettage as usually performed.—Dr. C. G. WHORLOW expected that barium sulphate emulsion injected into the uterus would pass into the abdominal cavity and remain there as a foreign body and not be absorbed in 72 hours.—Mr. J. GRIFFITH suggested the use of adrenalin as a hæmostatic in place of the suction apparatus.

Reply.

In reply, Mr. SEYMOUR said that regarding the use of adrenalin for stopping the dripping of blood during an endoscopic examination of the uterus, he had tried it and found it to fail, whereas continuous suction was successful.

ABERDEEN MEDICO-CHIRURGICAL SOCIETY.

A CLINICAL meeting of this Society was held on Dec. 3rd, with Dr. JAMES CROMBIE, the President, in the chair.

Exhibition of Cases and Specimens.

Mr. A. MITCHELL showed a boy, aged 8, suffering from Perthes's disease of the hip-joint, with accompanying skiagrams. He pointed out the difficulties of early diagnosis of tuberculous disease of the joint and the difficulty of differentiating between tuberculous lesions and Perthes's disease. In his opinion this patient had recovered much too rapidly to have had a tuberculous lesion. He also showed a girl, aged 18, with fusion of the bodies of the fifth, sixth, and seventh cervical vertebræ with practically no impairment of the movements of the neck. In this case there was a history of a fall when aged 6 months.—Mr. WILLIAM ANDERSON confirmed Mr. Mitchell's opinion as regards the early diagnosis of hip-joint disease.

Mr. WILLIAM ANDERSON showed a case of diffuse carcinomatosis of the breast, where the only complaints were stiffness of the shoulder and œdema of the arm, the duration of symptoms being two weeks. There was no palpable tumour in the breast, but marked cancer en cuirasse in the lower segment. The axillary glands were markedly enlarged. Microscopic examination of a small piece of skin showed extensive infiltration of the deeper layers with carcinomatous cells. Operative treatment was not advised.

Mr. G. H. COLT showed a man, aged 68, with marked fixation of the lower jaw following removal of a recurrent tumour of the right cheek and alveolar margins. The contracture was evidently not due to any affection of the temporo-mandibular joint, but rather to adhesion of scar tissue in the cheek, which had been split at the time of operation, to the upper and lower jaws. Mr. Colt asked for suggestions as to further treatment, his own suggestion being to divide the constricting bands and to insert an epithelial graft which could be kept in place by a stent mould with the jaw half open.

Mr. ANDREW FOWLER showed a girl, aged 13, whose fifth metacarpal bone of the left hand had been removed intact for a possible sarcoma. A tibial graft, including periosteum, had been inserted with very little shaping, and in the space of 19 months this graft had almost assumed the shape of a metacarpal bone with a head and new "metacarpo"-phalangeal joint. The usefulness of the hand was not impaired, there being two-thirds normal flexion at the new joint, and the patient, according to her own statement, is able to play octaves on the piano. On microscopic examination the tumour was found to be an osteochondroma. A series of skiagrams illustrated the changing appearances of the graft.—Mr. MITCHELL emphasised the importance in these cases of beginning active and passive movements at an early date after operation.

Dr. P. HOWIE showed two cases of deformities of the hands, one of brachydactyly of the ring finger of each hand, and one of megalodactyly. He also showed two patients who had been operated on for carcinoma of the stomach, a male in July, 1921, and a female in 1909. The male patient until recently had no sign of recurrence when he had a hæmorrhage from the bowel. The female patient looked very well and had no signs of recurrence.—Dr. A. G. ANDERSON, Dr. J. CRUICKSHANK, Mr. F. K. SMITH, and Mr. WILLIAM ANDERSON discussed the authenticity of the pathologist's findings in these cases. Dr. Cruickshank suggested that when a patient was alive a considerable period after an operation for carcinoma of the stomach the sections of the tumour ought to be sent to at least six pathologists for confirmation.

Mr. G. S. DAVIDSON exhibited a case illustrating one of the rarer causes of neonatal hæmorrhage. The case was one of a vaginal hæmorrhage in a 5 days

old child. He indicated the points in diagnosis and postulated an explanation of the cause of the condition.—Dr. EDWARD WALKER asked if Mr. Davidson could explain the cause of engorgement of the breasts in the newly born.

Dr. J. CRAIG exhibited a boy of 6 years who had during the last 18 months shown all the manifestations of rheumatic infection—viz., carditis, arthritis, chorea, and subcutaneous nodules. In Dr. Craig's opinion subcutaneous nodules of rheumatic origin are not so rare in this part of the country as is commonly supposed, he having seen three cases during the past year.—The case was discussed by Dr. A. G. ANDERSON, Dr. W. BROWN, and Dr. H. R. SOUPER.

Dr. A. C. FOWLER showed skiagrams of a gall-bladder containing numerous stones. Definite indentation of the pyloric antrum by the gall-bladder was seen during a barium meal investigation. The case was one of unexplained diarrhœa.

Dr. J. F. CHRISTIE showed a man of 70 with a slowly-growing ulcer on his left ear. The duration was 9 months without active treatment. On section the report was not definitely epithelioma. The Wassermann reaction was negative. There were no enlarged cervical glands. Dr. Christie asked for suggestions as to the diagnosis.—The opinion of the meeting was in favour of epithelioma and removal of the whole ear suggested as the treatment.

Election of Officers.

The following office-bearers and members of Council have been elected for the ensuing year:—President, Dr. J. Crombie; vice-president, Dr. J. F. Christie; secretary, Dr. H. Edgar Smith; treasurer, Dr. G. Rose; editor of transactions, Mr. G. H. Colt; librarian, Dr. W. Clark Souter; recording secretary, Mr. Andrew Fowler; assistant secretary, Dr. Robert Richards; members of Council, Dr. A. G. Anderson, Mr. F. K. Smith, Dr. H. R. Souper, Dr. G. M. Duncan, Dr. P. Howie, Dr. T. Fraser, Dr. J. Ross Mackenzie, and Mr. William Anderson.

PATHOLOGICAL SOCIETY OF MANCHESTER.

AT a meeting of this Society on Dec. 9th, Prof. E. D. TELFORD in the chair, a discussion on

Occult Sepsis

was opened by Dr. E. M. BROCKBANK, who referred to the various conditions of oral sepsis which produce metastatic affections of pyrexial and apyrexial nature in almost any organ of the body and which may be of slight nature or severe enough to cause death. He paid special attention to disease at the roots of old filled or crowned teeth which can only be recognised by X ray films taken and interpreted by experts in such work. This is a most dangerous dental lesion because there is no evidence of any disease about the teeth or gums to be seen by the unaided eye. The pyrexia which accompanies such foci or occult sepsis may vary from simple septic swinging temperature to a daily rigor of 105° F. or more lasting for weeks. Removal of such teeth leads to recovery from complications even after the lapse of several months.

Mr. BARRON J. RODWAY, who illustrated his remarks with a number of excellent slides, spoke of the difficulty of deciding how far oral sepsis was responsible for the causation of general illnesses, but drew attention to the frequency with which cases were seen where marked improvement followed dental treatment, which, prior to this, had come to a standstill under medical treatment. He described three types of dental condition likely to lead to a general infection—the neglected mouth, where the infection was chiefly the result of swallowing contaminated saliva and food; the mouth in which insufficiently treated non-vital teeth were present, where the infection took place entirely via the bone; and the mouth in which pyorrhœa was present, where the infection took place both from the swallowing of the products of the disease and also through the periodontal membrane. Reference was made to the question of deciding when to extract and how extensive an operation to make; and a comparison was made of the prospects of a possible cure of general disease at the price of having to manage with artificial dentures which, at the worst, would enable a selected diet to be dealt with, or the almost certain prejudicial effect of the continued presence of a definite source of infection by the retention of probably only partially efficient natural teeth in an unhealthy condition.

Mr. F. HOLT DIGGLE, after briefly dismissing the question of sepsis in the middle-ear cleft as a site for sepsis frequently overlooked—though in his opinion more commonly associated with disorders of malnutrition than arthritis or allied conditions—then considered the question of sepsis in the faucial tonsil. He pointed out that the submerged variety of tonsil was the greatest offender, and drew attention to the anatomical arrangement of the long, narrow, tortuous crypts, and the large absorptive area of the capsular surface of the tonsil, as factors rendering the tonsils peculiarly liable to the harbouring of unsuspected sepsis. After briefly considering the experimental and clinical evidence in support of the assumption that the tonsils may be the source of a systemic infection, he considered the results to be obtained by total enucleation of the tonsils. It was pointed out that tonsillectomy performed in cases of chorea did not yield such good results as those to be obtained in cases of arthritis, and particularly in cases of acute rheumatic infections. Mr. Diggle then dealt with the diagnosis of a septic tonsil, and pointed out that swabs taken from the tonsils of apparently healthy people were never sterile. He referred to the work of Howarth and Gloyne on this subject, and considered that factors other than bacteriological examination must be taken into account. He stressed the value of squeezing the tonsil to express material from the crypts, the bleeding from the crypts after moderate pressure, the local redness of the tonsil, and particularly the narrow red streak along the anterior faucial pillar, as perhaps less obvious evidences of tonsillar infection. He further considered that before a tonsil was sacrificed in cases of systemic infection we must be reasonably sure, first, that the tonsil is diseased; secondly, that the tonsil is the only source of infection; and, lastly, that if the tonsil is infected it is the source of the general infection.

In his opinion dental sepsis should be corrected before tonsils were removed, and a complete bacteriological examination of the intestinal and genito-urinary tract as well as the coöperation of the dentist and radiographer should be essentials in the investigation of every case. The question of sepsis in the nasal accessory sinuses was very briefly considered. It was pointed out that the absence of a purulent nasal discharge did not exclude the existence of pus in one of the sinuses. Mr. Diggle stressed the value of examination of all the sinuses by means of the suction syringe in doubtful cases.

Corrigendum.—Prof. Arthur Ellis wishes it to be known that he did not take part in the discussion on Nephritis at the Section of Medicine, R.S.M., on Nov. 24th. The remarks attributed to him in our issue of Dec. 5th (p. 1168) were made by Dr. H. A. Ellis.

APPOINTMENT OF A NEW VIVISECTION INSPECTOR.—The Home Secretary is about to appoint an inspector under the Cruelty to Animals Act, 1876. The post is permanent and is pensionable in accordance with the general rules governing the grant of pensions in the Civil Service, and the appointment will be subject to a period of probation. The salary will be £800 a year, together with bonus on the scale authorised for the Civil Service and travelling allowances at the usual Civil Service rate. The inspector will be required to give his whole time to his duties, and to reside at Edinburgh for the time being. Candidates for the post who possess the scientific qualifications required for the work and are not over 50 years of age, should apply to the Private Secretary, Home Office, Whitehall, London, S.W. 1, from whom further information may be obtained. Applications should be accompanied by one or two testimonials and particulars of the candidate's qualifications, and should reach the Home Office not later than Jan. 15th, 1926.

Reviews and Notices of Books.

BIOCHEMISTRY.

Applied Biochemistry. By WITHROW MORSE, Professor of Physiological Chemistry and Toxicology, Jefferson Medical College, Philadelphia. London: W. B. Saunders Company, Ltd. Pp. 958. 32*s.* 6*d.*

Prof. Morse's book aims at covering the whole field of biochemistry, both from its physiological and pathological aspects. Physical chemistry, methods of analyses, and even recent views on the structure of the atom and matter are dealt with. The range of the author's task thus will be appreciated, and Prof. Morse has succeeded to a really remarkable extent in fulfilling it. The book opens by defining the aims of biochemistry in general and tracing out the scientific ancestry of the great American biochemists. The author proceeds to a general but thorough consideration of the structure of matter, including the electron and proton theory. The lattice structure of crystals is discussed. Physical chemistry of solutions is next dealt with and particular reference is made to hydrogen-ion concentration. This section is an excellent, clearly written account of the physical chemistry of ionisation, and the author points out its application to the acid-base problems arising in the body. Enzymes and colloids are next reviewed, after which the elementary composition of tissues is dealt with. The three succeeding chapters are taken up with the chemistry of proteins, fats, and carbohydrates, whilst the fourth is devoted to the chemistry of tissues in general. The following chapter concerns the chemistry of foods, and then digestion, absorption, and metabolism are discussed. The biochemical aspects of urine, ductless glands, and nutrition are also dealt with quite fully. Under the title of Practical Exercises on Urine and Blood a scheme for practical work is included, and in an appendix methods for the preparation of various reagents and solutions are given. After each chapter a series of selected references is included, and throughout the text appear portraits of many of the workers referred to, in many cases short biographical notes being given.

From this outline it can be understood that here is no ordinary volume. The conception of providing a complete work on so huge a subject is admirable, and the author has succeeded in conveying to the reader the idea that biochemistry is an active dynamic subject. Some minor points are open to criticism. To the English reader the renaming of proteins, fats, and carbohydrates as proteids, lipids, and glucids is distasteful. There are a few errors in the biographical notes; for example, Dr. F. G. Donnan would undoubtedly be surprised to see himself described as a professor of physiology. Some few of the illustrations are redundant. But these things amount to nothing. Prof. Morse has performed a wonderful service to biochemistry and its students, and any reader equipped with his volume could be regarded as being well armed.

Monographs of Biochemistry. Edited by R. H. A. PLIMMER, D.Sc., and Sir F. G. HOPKINS, M.A., M.B., D.Sc., F.R.S. *Hexosamines and Mucoproteins.* By P. A. LEVENE. Rockefeller Institute for Medical Research, New York. London: Longmans, Green and Co. 1925. Pp. 163. 10*s.* 6*d.*

THIS volume consists for most part of a summary of the author's own researches. Dr. Levene has performed so much pioneer work himself in this field that the excellence of the volume goes without saying, and since he has published many recent papers, it is expedient to have his results in a monograph. In the present volume the subject of hexosamines and mucoproteins is dealt with very thoroughly and the historical summaries are full and useful. One of the most interesting chapters is that dealing with the Walden inversion. This difficult subject has received little attention in the English language, and Dr. Levene's account of its importance in relation to the hexosamines forms one of the most valuable features of the book. Dr. Levene points out in his introduction that there need be no apology for writing a volume on such a specialised subject, since mucoproteins are constituents of every tissue.

SEWAGE PURIFICATION AND DISPOSAL.

Second edition. By G. BERTRAM KERSHAW, M.I.C.E. Cambridge Public Health Series. Cambridge University Press. 1925. Pp. 339. 18*s.*

THE appearance of the second edition of this useful book will be welcomed by all who are interested in the subject of sewage disposal. Much work has been done since 1915, when the first edition appeared, especially with regard to the so-called activated sludge process. The new chapter entitled Activated Sludge Processes, Sludge Digestion, contains an account of the Sheffield bio-aeration process, which it is intended to apply to the whole of the sewage of Sheffield. We regard this as an important inclusion, because we believe that Mr. John Haworth, the manager of the Sheffield works, was the first to show that sufficient oxygen for biological purposes could be introduced into the sewage by mechanical agitation without the necessity for blowing in air. Mr. Kershaw, in his capacity as engineer to the Royal Commission on Sewage Disposal, had an excellent opportunity of familiarising himself with all methods, and he has utilised that opportunity to the full.

The new edition has been brought thoroughly up to date, and we commend it to all who have to deal with sewage purification and disposal.

SKULL FRACTURES.

Roentgenologically Considered. By WILLIAM H. STEWART, M.D., Roentgenologist to the Lenox Hall and Harlem Hospitals. New York: Paul B. Hoeber. 1925. Pp. 64. $12.

IN this volume by means of a series of fine skiagrams practically every possible fracture of the skull is illustrated. Each illustration is accompanied by a short clinical account of the case and the nature of the accident from which the injury resulted. A brief chapter on rontgenographic technique indicates precisely the method adopted, but we fear the surgeon might follow its instructions implicitly without obtaining such results, unless he possessed the supreme skill which these must have required. The plates are in every instance superb, and, quite apart from their surgical value, they present a remarkable series of studies of the human skull which should be of great interest to the anthropologist. The book is magnificently produced.

PRACTICAL PHARMACOGNOSY.

By T. E. WALLIS, B.Sc. Lond., F.I.C., Ph.C., Lecturer in Botany to the Pharmaceutical Society of Great Britain. London: J. and A. Churchill. 1925. Pp. 115. 7*s.* 6*d.*

THE work of the student of medicine is now far removed from that of his predecessors, who manufactured their own drugs, this work to-day being undertaken by the manufacturing chemist. He cannot, however, altogether afford to neglect any of the links in the chain of the healing art. This book of practical pharmacognosy will make an appeal to the doctor who takes interest in drugs as well as to the student in pharmacy, to whom it is of more vital interest. Mr. H. G. Greenish, who writes a commendatory foreword, points out that, too often, the teacher of pharmacognosy is contented to lecture on the subject and to leave the student to examine the crude drugs at his leisure, without systematic instruction

or guidance, with the result that he acquires but a superficial acquaintance with the drugs at his disposal. In this book the earlier portion is devoted to 18 schedules of instructions, which state fully but concisely the details of practical work for each day of the course. The descriptions are clear and free from unnecessary material. The later part is devoted to the description of 45 medicinal plants indigenous to Great Britain: this sets out their characteristics and makes their recognition easy.

The writer is to be congratulated on his book and especially on the illustrations, largely by himself and his wife, which make the volume attractive.

PREVENTIVE MEDICINE.

Second edition, revised. By MARK F. BOYD, M.D., M.S., C.P.H., Member of the Regular Field Staff, International Health Board of the Rockefeller Foundation. London: W. B. Saunders Company, Ltd. 1925. Fully illustrated. Pp. 429. 20*s*.

THIS book, the first edition of which appeared in 1920, bears impress of a somewhat different outlook on public health from that of this country. Thus the subject of meat inspection is dismissed with a few words because "in the United States but little progress in meat inspection has been made"; on the other hand, rather more attention is paid to tropical diseases, such as malaria and uncinariasis. Interest attaches to a statement that "thanks to national prohibition this disease (alcoholism) will soon be a matter of historical interest in the United States." The book has not been written for the specialist but for practitioners whose daily work is causing them more and more to require general knowledge of preventive medicine, and the perspective is good. One of the most difficult subjects to deal with in an elementary way, that of statistics, is clearly and simply discussed. The book may be recommended to medical students who to-day in certain schools have to face a separate examination in public health; they can easily supplement their knowledge by reference to English standard text-books, many of which are not presented in so simple or so readable a form. The volume is profusely illustrated; for the most part the illustrations are good, but some are not informative.

EVOLUTION AND GENETICS.

By T. H. MORGAN. Princeton: University Press. 1925. Pp. 211. 9*s*.

Prof. Morgan says: "It has been pointed out that the power to reproduce itself puts the problem of the construction of a living organism on a different footing from the construction of a complex machine out of inorganic material." It is easy to believe that a problem is likely to reproduce itself a good many times if it is written about in this way. Unfortunately, Prof. Morgan's most interesting defence of the possibility of Mendelian mutants being the origins of new species is spattered with sentences more appropriate to those mystics of biology on whom he pours so much scorn. The book is a robust statement of his belief and is framed mainly as an answer to Bateson's statement that modern genetics had thrown no light on the production of fresh species of animals and plants. It is true that no observed mutant has shown the hybrid sterility of natural species; it is equally true that most mutants which have occurred under observation would have apparently no chance of survival in the real competitive world. But it is only necessary to suppose that one or both of these things happens very occasionally, and it may well be that it is necessary for permanent establishment that a hybrid should be sterile with the original stock so that the fresh form may have a position in nature delimited from that of its progenitors. And in a general way Prof. Morgan puts forward a strong case for looking on animals and plants as compounded on a gene basis. But it is not really necessary to his argument to show that Lamarckians are wholly wrong—which, indeed, he plainly fails to do. It seems much more likely that both views are partly right.

With some reservations we can commend the book as a stimulating critique of evolution theory from a modern point of view.

THE PHYSIOLOGY OF MIND.

An Interpretation based on Biological, Morphological, Physical and Chemical Considerations. By FRANCIS X. DERCUM, A.M., M.D., Ph.D., Professor of Nervous and Mental Diseases in the Jefferson Medical College, &c. London and Philadelphia: W. B. Saunders Company. 1925. Pp. 287. 16*s*.

Prof. Dercum believes that he has solved the great problem of mind and body. This he does by a series of ingenious speculations, based upon the findings of physiology and chiefly concerning neurones, which renders unnecessary the conceptions of psychology: in fact, he says in his preface that there is an inherent objection to the term "psychology," for psychology can only be regarded as a department of brain physiology. An example will show the apparent simplicity of this point of view, which is not novel, though the author uses the latest advances in knowledge to elaborate his explanations. He points out how "the retraction of the dendrites and axones of the neurones explains the palsies and anæsthesias of hysteria" (p. 225), and then describes how Babinski showed that the anæsthesia arises because of the method of examination. So we may imagine the examiner saying, "Do you feel this?" when straightway the dendrites and axones retract and the anæsthesia comes into being. There is no doubt that every human action, thought, or emotion can, with some ingenuity, be explained by a similar postulate. But is this helpful? And is it physiology?

WELFARE WORK IN INDUSTRY.

Edited by ELEANOR T. KELLY, B.A. London: Sir Isaac Pitman. 1925. Pp. viii. + 119. 5*s*.

THIS volume has been written by members of the Institute of Industrial Workers, under the editorship of its President, Miss E. T. Kelly. It contains a concise outline of the principles and practice of welfare work in factories, and while chiefly intended for those engaged in industry, is of considerable interest to all whose work brings them into contact with cognate problems. The book is written from an idealistic standpoint, and the chapter dealing with the activities of the works' doctor demands an extremely high standard of service from this hard-worked officer. A valuable section is the appendix, containing, amongst other things, specimen record cards for medical inspection, for the categorisation of accidents, and an interesting section on industrial fatigue.

The book is a reasoned attempt to establish a philosophy which will be a guide to the student and a basis for the professional worker.

JOURNALS.

QUARTERLY JOURNAL OF EXPERIMENTAL PHYSIOLOGY. Vol. XV., Nos. 3 and 4. 1925. Pp. 201–450. 25*s*.—Among the articles appearing are the following. The Effect on the Stomach of Stimulation of the Peripheral End of the Vagus Nerve, by E. D. McCrea, B. A. McSwiney, and J. S. B. Stopford. The authors give a summary of the facts elicited by previous workers on the effects of vagal stimulation as regards (1) motor effects, (2) inhibition, (3) on the fundus and cardia, (4) on the pyloric sphincter, (5) the vasomotor phenomena, (6) on the duodenum, and (7) the relation of vagal stimulation to tonus. They discuss advantages and disadvantages of their technique, which consists of the introduction into the stomach of a balloon with an air system, or with a water system, or the water distension method, the observations being made by

means of X rays. The main conclusions reached are as follows: The primary effect of stimulation of the peripheral cut end of either vagus on the stomach is dependent on the existing condition of the peripheral mechanism ("tonus"), and may be inhibitor or augmentor. The inhibitor or augmentor effect may involve both "tonus" and movement. The final effect of stimulation is to bring about augmentation of existing movement or to initiate movement. "Tonus" and contraction may vary inversely or directly.—The Effects of Fatigue and Temperature on the Adrenal Bodies of the Rat, by Swale Vincent. If white rats are exercised at room temperature in winter by means of a revolving drum made of wire netting and driven by a motor, their body temperature will fall and the chromaphil reaction of the adrenal medulla will be markedly reduced. If they are exercised at higher temperatures their body temperature will rise and the chromaphil reaction will not be reduced. At about from 18° to 20° C. the body temperature neither rises nor falls with exercise, and the chromaphil is unaffected. Considerable reduction of the temperature of the surrounding medium may, independently of exercise, cause a diminution of the chromaphil reaction if the animal's temperature becomes lowered, but this does not occur very frequently in the case of white rats. It seems, then, that the effect of exercise on the chromaphil reaction is not direct but secondary to the lowering of the animal's temperature.—The Active Principles of the Posterior Lobe of the Pituitary Body, by Walter Schlapp. Uncertainty exists as to whether the many physiological responses known to be evoked by extracts of the posterior lobe of the pituitary body are to be attributed to one or to more than one active principle. Histological and physical means have been employed. The author reviews the results already obtained and then describes his own method of preparing extracts from desiccated pituitary material. He finds that when depressor-free extracts are boiled with dilute hydrochloric acid, the oxytocic, pressor, and melanophore responses evoked by them are destroyed slowly and simultaneously. By treating depressor-free extracts with N-butyl alcohol it is possible to separate a fraction into which the greater part of the oxytocic activity has passed. By producing precipitates of lead sulphide in extracts by passage of sulphuretted hydrogen gas through suitable concentrations of lead acetate all the active principles are to some extent adsorbed. But the quantity of pressor and melanophore substance adsorbed exceeds that of oxytocic adsorbed by a significant amount. These results show that the oxytocic response on the one hand and the pressor and melanophore activities on the other must be attributed to distinct substances. The experiments, however, provide no positive evidence that the pressor and melanophore responses are due to distin t substances.—The Structure and Function of the Spleen, by John Tait and Martin F. Cashin. The authors give a full review of the literature of the subject as regards structure, the phagocytosis of particles, the reticulum, arteries, ellipsoids, veins, injection of vessels, the course of blood in the spleen, and its contractility. The spleens, chiefly of dogs and cats, were perfused by the arteries and veins with warm Ringer's fluid charged with specially prepared Indian ink particles. The authors find that the spleen is divided into segmental zones or lobes, corresponding to the branches of the arteria lienalis which enter it. These zones are at once arterial and nervous units. The scheme of subdivision of the splenic nerve corresponds to these segmental zones, and stimulation of a branch of the nerve causes only a section of the spleen to contract. Central to the cœliac ganglion (e.g., in the splanchnic nerve or in the anterior spinal roots) there is no such segmental representation in the branches proceeding to the spleen. The splenic vein is conspicuously larger than the splenic artery, that of the ox being five times the diameter of the artery. When a short section of the vein is electrically stimulated it contracts and remains in strong contraction for an hour or more, the outflow of blood being greatly impeded. When the spleen is perfused with Indian ink the particles may come to rest in four different situations: (1) in the ellipsoids, (2) in the spleen phagocytes, (3) on the ordinary reticulum, (4) on the walls of the venous sinuses. In the living animal deposition in the ellipsoids is temporary. Within three hours after intravenous injection of the ink phagocytes have begun to clear the particles from the spaces within the ellipsoids. Twenty-four hours later the ellipsoids are free. The phagocytes of the pulp retain the particles for weeks on end. At first they clear the ink off the reticulum. After a month they can be seen to have undergone a rearrangement, and some have migrated into the Malpighian corpuscles. The ellipsoids act as valves, readily allowing the blood to flow in the normal direction—i.e., from the interior to the exterior of the ellipsoid—but instantly closing against higher pressure applied to their exterior. The existence of these valves accounts for the difficulty of perfusing the spleen backwards—i.e., from vein to artery. Each ellipsoid is surrounded by a number of venous sinuses which become dilated when the venous pressure is increased.—The Appearances of Mammalian Erythrocytes under Dark-ground Illumination, by W. G. Millar. No sign of internal structure can be seen in the human erythrocyte.—Technical Points Important for the Study of the Metabolism of Rabbits, by V. Korenchevsky.—The Pancreas of Teleostean Fishes and the Source of Insulin, by Swale Vincent, E. C. Dodds, and F. Dickens.—The Sensitivity to Different Regions of the Spectrum of Individuals with Hypochromatic Vision, by H. N. Bradbrooke and H. E. Roaf.

New Inventions.

RING GRIP FORCEPS.

THERE is perhaps no more delicate piece of manipulation in all surgery than that required of the left hand of the ophthalmic surgeon when he picks up with his forceps a minute strand of the iris preparatory to iridectomy. The tissue to be gripped is so slight, it is so often obscured by overlying tissues or blood, and the margin of safety in the movement of the iris is so narrow that the mastery of the forceps through which the actual movement has to be made should be as perfect as is possible. For a perfect success the instrument—the forceps—should be a part of the hand of the surgeon, as much part of

it as ungual appendages to his fingers. There are many excellent iris forceps in use, but they all remain an instrument in the hand—they do not become part of the hand. In the forceps, of which an illustration is here given, the customary solid side plates or bows are expanded so as to allow a ring to be cut through the flat of each side. These rings are 8 mm. in diameter inside, their edges are square and not bevelled. They are cut in the positions into which the thumb or first finger naturally falls when holding the forceps. When the forceps are taken up as in use the pads of the extremities of the thumb and index-finger fill these holes in the forceps, and at the moment that the teeth of the forceps engage the skin of the thumb and finger come into contact, so that one feels that the forceps are almost a part of the hand and that the points are just the extensions of the finger-tips. The sense of direction and security this gives is remarkable. The grip is applicable to any form of forceps.

Messrs. John Weiss and Son, Ltd., Oxford-street, London, are the makers of the instrument.

N. BISHOP HARMAN, M.B., B.Ch. Camb., F.R.C.S. Eng.

THE LANCET.

LONDON: SATURDAY, DECEMBER 26, 1925.

THE EFFICIENCY OF THE HEART.

PROGRESS in the study of any fundamental principle in science may conveniently be divided into three stages. The enunciation and qualitative proof of the principle naturally marks the first stage. In the second greater elaboration of technique leads inevitably to a quantitative interpretation of the particular phenomenon studied. This in its turn stimulates the imagination to a still deeper and more intricate examination of the intermediary steps involved and finally to a re-examination from a quantitative point of view of the facts thus brought to light. The study of metabolism, as was pointed out by NOORDEN, forms an excellent illustration of progress along these lines. The qualitative period may be said to have been inaugurated by Wöhler's synthesis of urea and by his proof of the synthetic capabilities of the organism in respect to hippuric acid. The quantitative period of VOIT and PETTENKOFER followed, and the gross chemical principles laid down by them are now being analysed in terms, qualitative and quantitative, of intermediate metabolism.

The study of the circulation is proceeding along comparable lines. It is nearly 300 years since WILLIAM HARVEY made his supreme contribution to biology by showing that "it is absolutely necessary to conclude that the blood in the animal's body is impelled in a circle and is in a state of ceaseless motion; that this is the act or function which the heart performs by means of its pulse; and that it is the sole and only end of the motion and contraction of the heart." In two lectures on the efficiency of the heart and its measurement, the second of which we print in this issue, Prof. YANDELL HENDERSON points out that by means of a method introduced by Dr. H. W. HAGGARD and himself it is at long last possible to measure the circulation rate in man under a variety of physiological conditions and even in cases of moderate cardiac impairment. All the methods which have been used hitherto on man, and which at the same time may lay claim to some degree of accuracy, are based on FICK'S principle—namely, that if we know the difference in the oxygen contents of the arterial and venous blood coming from and going to the lungs and at the same time the oxygen consumption of the individual under examination, the ratio of the latter to the former of these two figures gives us a true measure of the cardiac output, assuming, of course, that no oxygen is utilised in the lungs themselves. An exactly analogous method has also been adopted in which the ratio of CO_2 production to arterio-venous CO_2 difference is determined. The oxygen or CO_2 content of the arterial and of the venous blood is determined from analyses of arterial and venous alveolar air respectively, the gaseous tensions so found being interpreted in terms of blood oxygen or carbon dioxide content from the oxygen or carbon dioxide dissociation curves of the blood of the person investigated. These methods are complicated, and since they require the active and intelligent coöperation of the subject under examination are entirely unsuited to clinical use. KROGH'S nitrous oxide method suffers from the same drawbacks. In ethyl iodide, however, Prof. HENDERSON and Dr. HAGGARD have found a volatile substance which not only possesses a low solubility coefficient, but also has the great advantage of being destroyed in the tissues, there being thus no necessity to limit the experiment to the time of one circulation. It has been shown that the partition coefficient of this gas between air and blood is 2. Given, therefore, the amount of ethyl iodide absorbed over a given period of time and a knowledge of the content of the alveolar air in this gas, we can readily calculate the volume of blood which has passed through the lungs in that time. The method is simple, accurate, and involves no more coöperation on the part of the patient than a simple basal metabolism determination.

The chief function of the heart is to supply oxygen at a high pressure to the working tissues. That is to say, the mean capillary oxygen unsaturation of the blood must be maintained at a low level by a correspondingly rapid rate of blood flow. Clearly the first indication of circulatory failure will be a rise in the arterio-venous oxygen difference. As Prof. HENDERSON states in his lecture, "the arterio-venous oxygen difference is the best possible index and measure of functional efficiency of the heart." Prof. HENDERSON'S great contribution to medicine is that he has made it possible accurately to measure this difference not only in persons under varying conditions of physiological stress, but also in patients suffering from moderate degrees of cardiac impairment. He has determined that this difference is constant at a value of 3 to 4 volumes per cent. in dogs and men of very varying size, and appears to be a fundamental mammalian "constant" comparable to that of body temperature, of hydrogen-ion concentration of the blood, and of arterial pressure. On account of this constancy in the arterio-venous oxygen difference in all vigorous mammals and of the direct proportionality between basal metabolism and body surface, it is interesting to note that the volume of the circulation also becomes a function of body surface and not of body weight. Small animals therefore have a relatively more vigorous circulation than large, and this relative increase in the circulation rate with diminution in size is conditioned not by an increase in the stroke volume of the heart, but by an increase in rate. Indeed, Prof. HENDERSON has shown that the output of the heart in all healthy vigorous animals during bodily rest is 1·4 to 1·8 c.cm. of blood per kilo per beat. This figure is known as the stroke index. With moderate activity there appears to be very little increase in this index, the increased blood flow being mainly determined by acceleration in the pulse-rate. In more vigorous exertion, however, the second and third reserves of the circulation are called up—namely, an increase in the arterio-venous oxygen difference and an increase in the stroke index. Of extreme interest to clinicians is the relatively enormous increase (40 to 50 per cent.) in the circulation rate occasioned in normal men by a change from the upright to the lying posture.

Prof. HENDERSON has accumulated a large stock of data on the circulation in health, and these figures must prove of great value as a base line from which to compute the significance of corresponding figures found in pathological states. Should the method which he now places in the hands of physiologists prove as valid 300 years hence as HARVEY'S immortal discovery proves to-day, his contribution will indeed be significant.

SCARLET FEVER AND THE DICK TEST.

THE control of scarlet fever is still unachieved. Since the passing of the Public Health Act of 1875 hospital isolation has afforded individual patients a better chance of recovery, but it has done nothing to diminish the incidence of the disease. This was admitted quite freely at a recent meeting of the Royal Society of Medicine,[1] when Dr. M. GREENWOOD stated that the only hope lay in immunisation, and there was none to disagree with him. Fortunately the publication of the work of the DICKS in 1924 has opened up an entirely new prospect, and the three papers on the Dick test which appear in our present issue will serve to illustrate what has already been done and what still remains to do. The first thing needful is to know who are and who are not susceptible to infection. We know broadly, write Dr. R. A. O'BRIEN and Dr. C. C. OKELL, that a negative response to the Dick test indicates a high degree of non-susceptibility, but it is not so clear that a positive reactor may not possess some immunity. As Dr. ALEXANDER JOE points out, the choice of toxin is of the utmost importance, and we are still far from possessing a standardised test material. Nevertheless, the toxin he used gave 95 per cent. of positive results in clinically recognised cases of scarlet fever during the first five days of illness, and 88 per cent. of negative results in persons with a previous history of scarlet fever. Dr. F. A. E. SILCOCK tells us that five of his cases at first clinically diagnosed as scarlet fever were found to give a persistently positive reaction, and none of them desquamated or showed any complication suggestive of scarlet fever. Further than this a strong positive reaction in contacts suggests that the disease is incubating. Negative reaction means either that the individual is immune, or that there are sufficient quantities of antitoxin circulating in the blood, as a result of previous infection or subinfection, to prevent development of the fever. Only about 20 per cent. of persons fail to acquire this immunity before 20 years of age. The test is undoubtedly effective in separating the susceptible from the immune. Recent work from the Birmingham City Fever Hospital continues[2] the work of the DICKS on the toxin of *Streptococcus scarlatinæ*. Although this organism does not completely fulfil KOCH'S postulates, it is pretty generally accepted as the causal parasite of scarlatina, and Dr. H. HENRY and Dr. F. C. LEWIS have concentrated on the preparation and standardisation of the toxin of this micrococcus. Their work indicates that the value and reliability of the Dick test is relative, and relative also is the immunity to the *S. scarlatinæ*, whether natural or acquired. A sufficiently small dose of the toxin will produce a negative reaction in all subjects, and a sufficiently large one will make them all positive. While they aim at the standardisation of the dose in some form of unit, they opine that the toxin-antitoxin combination on which the immunity depends is itself unstable and liable to dissociation.

The use of the Dick method for immunisation is on a less proven footing. The general conclusion seems to be that it is possible to produce immunity in 90 per cent. of susceptible persons by introducing large doses of scarlatinal toxin. Dr. GEORGE BUCHAN, in his recent presidential address to the Society of Medical Officers of Health, stated his opinion[3] that the Dick test and immunisation, or some modification thereof, should be made available in this country for those who would secure protection for their children against scarlet fever. He regards the task as a matter for local sanitary authorities, and points out that it would well repay these bodies to employ an epidemiologist to devote himself to the prevention and control of infectious diseases. Acting on this view the health department of the City of Aberdeen has issued a memorandum by Dr. J. P. KINLOCH (dated Nov. 23rd) describing Dick testing and immunisation with a schedule of biological products for diphtheria and scarlatina which can be obtained on request at the City Hospital Laboratory. From China comes a report[4] of a new serum prepared from throat swabs of severe cases by a method radically different from that of the DICKS. Dr. S. P. CHEN, superintendent of the Government Isolation Hospital at Peking, found the varieties of antiscarlatinal serum previously used of little value in the toxic type of scarlet fever, of which there is a large proportion in North China. Instead of using a toxin as antigen, Dr. E. T. H. TSEN and Dr. P. Z. KING, of the Central Epidemic Prevention Bureau, used washed whole bacterial bodies, first dead and then living, after passage through a horse. The animal was immunised with 12 doses of dead cultures, and subsequently with 14 doses of living bacteria, in gradually increasing amounts. In the absence of a conclusive protection test for the scarlet fever streptococcus these investigators found it satisfactory to use in mice a virulent strain of hæmolytic streptococcus from a case of erysipelas. It may here be recalled that O'BRIEN and OKELL found the hæmolytic streptococcus isolated from a case of lymphangitis to give all the DICK reactions. Nineteen different strains of scarlatinal coccus were used by the Chinese workers as there seemed to be trifling differences in growth among them. The serum has only been in use for a year, but as some of the cases regarded at first as hopeless made a good recovery, Dr. CHEN issued a preliminary report. Improvement sets in within 48–72 hours after an intramuscular dose of 25–50 c.cm. of the unconcentrated serum, and in spite of continuance of the pyrexia, the patients evidently had turned the corner. Given early, the serum seemed to ward off serious complications and to cut short erysipelas.

[1] Section of Epidemiology and State Medicine, THE LANCET, Oct. 31st, p. 919.
[2] THE LANCET, April 4th, p. 710, and Sept. 19th, 1925, p. 587.
[3] Public Health, November, 1925, p. 33.

DENTAL RESEARCH.

IN no department of medicine is inquiry into the nature of disease likely to be better rewarded than in dentistry. Pragmatism is increasingly the spirit of research. Four years ago the Medical Research Council set apart a committee to investigate dental disease on a broad basis, and the second report[1] of this committee has just appeared, containing the results of an inquiry by Mr. N. J. AINSWORTH, L.D.S., into the teeth of 4000 children in public elementary schools. The investigation has been of a very arduous and complete character, the statistical reduction of the data being carried out by Dr. MATTHEW YOUNG, a member of the Research Council's department of statistics. Definite replies are given to the main questions investigated. The calculated dates of eruption of the various teeth were found to correspond fairly closely with those given in dental text-books and generally accepted. The incidence of caries in the permanent teeth was found to be

[4] National Medical Journal of China, August, 1925.
[1] Medical Research Council: Reports of the Committee for the Investigation of Dental Diseases. II. The Incidence of Dental Disease in Children. Special Report Series No. 97. H.M. Stationery Office. 1925. 1s. 6d.

roughly the same in boys and girls, the tooth most often affected being the lower second molar (28·2 per cent. at 12–13 years), the upper lateral incisor being the most immune (0·4 per cent. at 9–10 years). Of the permanent molars the occlusal surface is by far the most frequently attacked; in the pre-molars the occlusal and distal surfaces equally, while it is the mesial surface of the upper incisors which suffers. Caries was found spontaneously arrested in a negligible proportion of the 6753 carious teeth examined—only about ½ per cent., in fact. Hypoplasia was associated with a double susceptibility to caries, and it is the hypoplastic area of the tooth that is attacked. Gingivitis, including slighter forms, was found in one-third of the children examined, older children having a larger proportion of the severer forms. In 23·2 per cent. of all children examined some degree of malocclusion was found.

The recent report[2] of the Research Committee of the Dental Board of the United Kingdom contains the interim reports of the various workers engaged in research under the auspices of the Board. Though the majority of the work is incomplete, it is obvious that dental science will be much enriched by these investigations which have only been made possible by the financial help of the Board. A very important piece of research is being carried out by Dr. W. W. ROSENHAIM and Dr. E. E. WALKER for the Department of Scientific and Industrial Research, to whom the Board entrusted a series of investigations on dental alloys and amalgams and on substitutes for vulcanite. The work on the silver-tin amalgams is now completed, and the report will shortly be published. It is stated that new facts have been obtained which may throw valuable light on the ageing of silver-tin alloys. Amalgam fillings play so large a part in conservative dentistry that this research is of special importance, and the dental profession is awaiting the results of the investigation with interest. Of equal importance is the research into vulcanisable rubber and its possible substitutes. Dr. WALKER states that he has been engaged on the development of a synthetic product capable of acting as a complete substitute for vulcanite in dentures, and that considerable progress has been obtained. The investigation into the histology of enamel caries by Mr. H. C. MALLESON has been recently published and has attracted much attention. Mr. MALLESON has been successful in devising a technique whereby sections of enamel can be cut after decalcification. This has enabled him to demonstrate the features of caries in enamel with great clearness and to add much to our knowledge of the microscopical phenomena of caries. The work initiated by Dr. J. K. P. CLARKE on the bacteriology of dental caries has been continued by Dr. MACLEAN, who is now engaged in a series of comparative experiments on the *Streptococcus mutans* of CLARKE and the *Bacillus acidophilus odontolyticus* of MCINTOSH and his fellow workers. Dr. MACLEAN is also investigating the types of streptococci in pyorrhœa. Mrs. M. MELLANBY is continuing her investigations into the dietetic and hygienic factors concerned in the calcification of the teeth in puppies, and is now attempting to produce caries in the teeth of dogs and other animals under experimental conditions with a view to studying the factors affecting the immunity of erupted teeth. Prof. J. C. BRASH, whose work on the growth of the jaws has already proved so valuable, is continuing his madder-feeding experiments in pigs in regard to the growth of the jaws and the eruption of the teeth. An independent investigation by Mr. WILSON CHARLES on the growth of bone, also by madder-feeding, makes piquant reading, for Mr. CHARLES suggests that experiments with madder are of doubtful utility in demonstrating bone growth. Statistical and anthropometric investigations are being carried out by Mr. AINSWORTH, Miss V. H. GEORGE, and Miss K. C. SMYTHE. Of these Mr. AINSWORTH's report has now appeared and is summarised above. Dr. E. W. FISH has commenced an investigation into the nutrition of dentine during adult life. In his report he states that so far the analyses of dentine show that there is a definite increase in the calcium content during adolescence and a corresponding withdrawal of salts in later life. This would suggest that the structure of the teeth plays an important part in deciding the occurrence of caries, a view strongly supported by the investigations which have been carried out over a long period by Mrs. MELLANBY.

Mr. J. T. CARTER is investigating the structure of enamel in modern and prehistoric mammals and reptilia. He finds that the enamel pattern is very distinct in the lower primates and insectivora. Mr. CARTER has been engaged for a considerable time in studying the comparative structure of enamel. At the time when the tooth of *Hesperopithecus* sustained its disastrous fall, Prof. ELLIOT SMITH suggested that here was an opportunity of putting to the test the views of Mr. CARTER, and seeing whether the enamel structure shed any light on the affinities of the owner of the tooth. Mr. CARTER'S researches have not become widely known, so that the announcement that a memoir on the enamel of fossil mammalian teeth will shortly be published will be welcome news to all interested in dental anatomy. An application for a grant was received from Messrs. R. A. BRODERICK, H. ROUND, and HERVEY WYATT to study the association of gastric ulcer and oral sepsis. They proposed to attempt to reproduce gastric lesions in rabbits by inoculation of cultures from patients with gastric ulcer associated with oral sepsis. In other words, this research was intended to repeat ROSENOW'S theory of elective localisation of bacteria and to test its validity. It is somewhat surprising that the Board, after consultation with the Dental Committee of the Medical Research Council, refused the grant on the grounds that the work did not appear "primarily to be concerned with dental research." ROSENOW'S views have attracted wide attention both in America and here, and it seems highly desirable that his experiments should be repeated in this country. It is true that their significance is not limited to dental sepsis, but it is chiefly in connexion with infection from the teeth that ROSENOW'S theory is discussed. It has so important a bearing on focal infection that we cannot understand the attitude which would deny to such an investigation as that proposed by BRODERICK and his fellow workers the right to be considered as a piece of dental research.

It is sure that all the various researches will not be equally fruitful, but it is certain that dental science will gain much from these investigations which cover so wide a field. Without the financial encouragement of the Dental Board many of these investigations could not have been commenced. Though many dentists have grumbled at the imposition of an annual fee by the Board, yet the fact that the revenue so obtained has enabled the Board to subsidise research on a scale never before approached in the dental profession in this country should reconcile them to this small recurrent obligation.

[2] Minutes of the Dental Board. Constable and Co., Ltd., 12, Orange-street, W.C.

ARTIFICIAL LIGHT AND X RAY THERAPY IN SCOTTISH HOSPITALS.—The Scottish Board of Health has issued an interim report on Artificial Light and X Ray Therapy so far as they are used in Scottish hospitals and sanatoria, signed by Dr. Lewis D. Cruickshank, and Dr. Ernest Watt. At the moment, the report says, there is no necessity to press for the installation of more equipment for artificial light in sanatoria, but the authorities should not be discouraged from providing it if they wish to do so. It is, however, recommended that a few of the larger tuberculosis clinics in industrial districts should be encouraged to provide suitable light equipment for the treatment of outdoor cases, and that some of the larger child welfare clinics should be equipped with mercury-vapour lamps. In the case of new X ray equipment a certificate of safety should be obtained from the National Physical Laboratory.

Annotations.

"Ne quid nimis."

LONDON SCHOOL OF HYGIENE AND TROPICAL MEDICINE.

WORK upon the foundations of the new School, which is to be erected in Bloomsbury to the design of Mr. Morley Horder, F.R.I.B.A., and Mr. Verner Rees, A.R.I.B.A., will shortly be commenced, the contract for this work having just been placed. While this work is in progress the working drawings of the building will be completed and the scheme for the engineering services, which have been entrusted to Mr. T. J. R. Kiernan, M.Inst.C.E., will be drawn up. Concurrently with these developments the board of management of the School are taking such steps as are immediately possible for supplementing the facilities at present available for D.P.H. students. A course in Parasitology is already being given to students in the laboratories of the Tropical Division of the School, and it is interesting to learn that arrangements have now been made by the authorities of the School with Prof. R. J. S. McDowall to deliver—with the consent of the King's College delegacy—a course of lectures in Physiology as applied to Hygiene. These will also be given in the premises of the Tropical Division (the old School of Tropical Medicine) at Endsleigh-gardens, Euston. In the Tropical Division itself some important changes are taking place. The School is shortly to lose the services of Lieut.-Colonel A. W. Alcock, F.R.S., the Director of the Department of Entomology, who is retiring under the age-limit. He is to be succeeded by Dr. P. A. Buxton, who has been selected for the post from among ten applicants. Dr. Buxton is now on his way home from Samoa where, for the last two years, he has been engaged upon a research expedition sent out by the former managers of the School of Tropical Medicine. The post of assistant in the Department of Entomology has also fallen vacant through the retirement of Lieut.-Col. H. J. Walton, I.M.S. (retd.), but this post will not be filled until Dr. Buxton has taken over his new duties at some date early in the new year. In the Tropical Division, also, the extended course, which commenced in October, and has attracted students from all parts of the world up to the full capacity of the accommodation, has been strengthened; the Director has been able with the assent of the Air Ministry to secure the services of Wing-Commander H. E. Whittingham for a series of lectures on Biochemistry, and a short course by Lieut.-Colonel A. J. Gage, I.M.S. (retd.), on Poisonous Plants is being added to the curriculum. The appointment of Lieut.-Colonel G. E. F. Stammers, R.A.M.C. (retd.), to the post of lecturer in tropical hygiene marks a further notable development in the work of the School. The following subjects will be embraced by this course: Tropical and subtropical climatology, personal hygiene, maternity and child welfare, housing in the tropics, food and dietetics, hygiene of food, water, excreta and refuse, disinfection and disinfestation, health measures, hygiene of native labour in the tropics, disposal of the dead, public health administration, and organisation in the tropics. In addition to the lectures given on these subjects at Endsleigh-gardens the students will be taken by Colonel Stammers to see demonstrations, in and about London, in milk-supply, water-supply, sewage and refuse disposal, disinfection, and meat inspection, and a whole day will be given to a visit to the Army School of Hygiene at Aldershot. This extended programme in the study of tropical hygiene, although forming part of the general course of the Tropical Division, will be a self-contained course for which the School are prepared to accept a limited number of students at a fee of £6 6s. The lectures and demonstrations will extend over a period of about three weeks from Jan. 13th to Feb. 4th, 1926. The subject of hygiene as applied to tropical medicine has not received in the past its due share of attention, but this has now become possible owing to the extension of the length of the School course, which we have already brought to the notice of our readers.

RECENT CANCER RESEARCH IN ITALY.

Prof. G. Tizzoni and Prof. E. Centanni, of the Universities of Bologna and Modena, have lately published a joint preliminary note on the Modifications produced by Radium on the Pulp of Adeno-carcinoma in Mice and its Transformation into a Curative Vaccine.[1] They base their researches on the principle that the most efficient weapon with which to attack a disease caused by a virus lies in the pathological products evolved by the development of the virus itself. It is not necessary that the nature of the virus, to which Gye and Barnard have drawn attention, should be known. In many diseases due to a filterable virus, such as rabies, small-pox, infantile paralysis, encephalitis lethargica, glanders, &c., practical scientific results have been achieved, although in ignorance of the morphological characters of the virus. In these cases the essential solution of the problem consists in finding, for such products as contain the virus in a natural culture, the conditions under which the death of the virus can be effected without injuring its vaccinating properties. With this idea the present researches were undertaken, using the mammary adeno-carcinoma of mice as the subject and pure radium bromide, one-tenth of a gramme, as the destructive agent. It was found that cancer pulp subjected to radiation for not less than 24 hours when injected into the tissue surrounding the tumour in quantities of ½ c.cm. arrested its growth and caused a gradual regression ending in complete disappearance. Cancer pulp subjected to radiation for a less time was found not to have this property, and when radiated for 40 hours was likewise inactive, having lost both its pathogenic and vaccinating power. These results seem important and are comparable to the attenuation of the virus and its transformation into a vaccine which was one of Pasteur's greatest discoveries. Control experiments were made with the pulp which had been frozen for 24–40 hours without being exposed to the action of radium and also with saline solution in doses of ½ c.cm. which had been irradiated. Both these proved to have no effect on the neoplasm. The control experiments led to the conclusion that the effect of the radiated pulp is not due to induced and acquired radio-activity, nor to its preservation on ice, but to its transformation into a curative vaccine. What these observers appear to have achieved is to have been able to destroy entirely by means of radium the pathogenic power of cancer pulp while retaining either completely or in large proportion its vaccinating properties. Prof. Tizzoni and Prof. Centanni are continuing their work on this vaccine to ascertain more particularly if and under what conditions it retains its activity, and if equally in a dry or liquid state; if a greater concentration and conservability is possible; if it can be purified from inactive and extraneous matter; if it acts only locally and in the zone surrounding the tumour, or whether it has the same efficacy when injected at a distance so that its use would not be limited to external tumours or those in easily accessible situations. Another important matter is to solve the question whether every vaccine is specific exclusively for the tumour from which it is derived, or whether the vaccine from one tumour has the polyvalency necessary to make it of use in other varieties of tumour. In the light of the discoveries of Gye and Barnard this particular vaccine may be able to attack either the generic factor, in which case its task would be rendered easy, or, on the contrary, the specific factor, in which case great and sometimes insurmountable practical difficulties would be met with, and it would be necessary to establish precisely the amount of radiation to be

[1] La Riforma Medica, Oct. 19th, 1925.

used in each special case. So far we have been summarising without comment the work of the Italian investigators. The method of inducing resistance to tumour growth by the introduction of irradiated tumour material is, however, not new. It was first used by Contamin in 1910 and subsequently by Russ and his collaborators in 1914 and 1922, with results which seemed to show that such a procedure induced resistance against subsequent inoculation, and even against the growth of unestablished tumour. But quite recently experiments on a large scale [2] have shown all these claims to be unfounded.

THE PHYSIOLOGY OF TASTE.[3]

THIS book is, we believe, the first complete translation into English of Brillat-Savarin's famous "Physiologie du Gout," and appears exactly 100 years after the completion of the famous original. The publisher has made of its production in appropriate and shapely form a labour of love, and has, we understand, supplied the translation himself, an exploit upon which he is to be thoroughly congratulated, for Brillat-Savarin is not an easy author to follow justly and fully in any language but his own. The "Physiology of Taste" is a long book, though not so long as might have been expected from the probability that its preparation occupied many years and much note-taking in totally different milieux. As a rule, when the great epicurean is quoted the extracts are taken from two particular chapters, one treating of gourmandism as a whole and dealing with the pleasures of the table, and the other dealing discursively with gastronomy. Such excerpts give only the slightest indication of the range of Brillat-Savarin's knowledge, eloquence, wit, and multiplicity of personal experience, as evidenced by his familiarity with classical authors and English novelists, the princes of French literature, and a host of other French writers. All these are laid under contribution, while the medley is kept interesting throughout by appropriate anecdotes, amusing renderings of personal sensations, sound physiology, and records of life and travel in various parts of the world. The reader will gain from this book, therefore, a very different impression of the author than he is likely to have derived from the frequent allusion to him and his work in general literature, where he usually appears as a great cook, a sort of rival to Ude or Francetelli, especially to the former, who himself wrote a treatise entitled "La Science de Gueule." Brillat-Savarin was not a cook any more than he was a doctor; he was a barrister who held high legal offices, a municipal authority, a politician and perhaps a trifle of conspirator, an antiquary, a country gentleman and sportsman, a frequent host, and an honoured guest at distinguished tables. All these sides of him appear in the "Physiology of Taste," and though in the sense in which the word is used by science he cannot be called a physiologist, there are passages and, indeed, whole pages in his work which will be appreciated by medical men.

Brillat-Savarin awards a high place among "gourmand professions" to that of medicine. Its members, he says, "are gourmands by seduction, and would need to be made of bronze in order to resist the force of circumstances. The dear doctors are the more welcome wherever they go, because health . . . is the most precious thing in the world. Always anxiously awaited, they are sure of the most flattering reception. A pretty patient summons them; youth greets them with caresses; a father, a husband, surrenders his dearest to their care. Hope turns their right flank, gratitude their left; they are fed at the beak like pigeons, and must needs submit; in six months the habit is upon them, and they are gourmands past redemption."

Mr. Davies's fine translation is embellished with some excellent designs by Mr. Andrew Johnson.

[2] F. C. Wood and R. E. Prigosen: Jour. of Cancer Research, vol. ix., September, 1925; J. C. Small, M. J. Evans, and E. B. Krumbhaar, ibid.

[3] The Physiology of Taste, or Meditations on Transcendental Gastronomy. By Brillat-Savarin. With an introduction by Arthur Machen and embellished with designs by Andrew Johnson. London: Peter Davies, 1, Bedford-street, London, W.C. 1925. Pp. 326. 2 guineas.

HEALTH ON BOARD SHIP.

THE latest report of Dr. J. Howard Jones, medical officer to the Newport Port Sanitary Authority, contains an indictment of the Board of Trade as the Government department responsible for looking after the health conditions of seamen. Dr. Jones points out that the 1923 Instructions to Surveyors as to the Survey of Masters' and Crews' Spaces do not differ materially from those issued in 1913, and that many of the British regulations, in contrast with some of those issued by other countries, are merely suggestions which can be and are ignored by builders. Section 15 states that officers' and engineers' quarters should be so placed that they are entered from a passage-way rather than from the open deck. In spite of this, several new vessels have been at Newport with cabin entrances so exposed that the cabins cannot be kept dry under bad weather conditions. Section 15 also advises that the men should be berthed above decks in houses or poops rather than in forecastles. "Yet," writes Dr. Jones, "on a ship recently built for local owners the seamen and firemen were housed in a narrow confined forecastle in which two of the berths or cots were placed in the narrow triangular space at the forward end of the forecastle, consequently there was hardly room for the men to move about in their quarters, and those berths had to be unshipped to allow of access to the forepeak through the hatchway in the floor for the lowering of ship's gears' stores into the forepeak." The vessel referred to contained many other flagrant defects, rendering her living quarters unsatisfactory, but she had satisfied the Board of Trade owing to the fact that the Board only suggests certain things, which should be strict requirements. As to the lighting of crews' spaces, the new regulations are, says Dr. Jones, less satisfactory than the old, in that the use of electric light instead of daylight is permissible to a greater extent than formerly. In view of the prevalence of tuberculosis among seamen, especially Lascars, a better standard of lighting is very necessary. Section 26 states that in new foreign-going ships suitable bath-rooms and washing places should be provided for the men. This is not compulsory, however, for recently a new foreign-going ship visited Newport without such accommodation. The old practice of whitewashing the walls of crews' spaces is dying out and being replaced by the much better practice of using white paint or enamel. Dr. Jones describes the testing of a certain distemper or water-paint advocated for this purpose, for which antiseptic properties were claimed. It was found that staphylococci and diphtheria bacilli grew quite freely on culture media when mixed with this distemper made up according to the instructions. Dr. Jones gives a description of the crews' spaces of a new vessel to illustrate the lack of common sense frequently shown in designing.

"The lighting on the men's quarter in the poop was seriously affected by the placing of four berths in both the firemen's and sailors' quarters against the ship's side, in consequence of which the lower bunks and most of the lower parts of the quarters were very dark. The quarters were cramped owing to the fact that the passage-way between the firemen's and sailors' quarters leading to the stores was unnecessarily wide. There was sufficient space available in the poop to provide two excellent berth cabins, a mess-room and bath-room or wash-house. Owing to the lack of bath-room or wash-house, the washing in wet weather would have to be done outside or in the combined living, feeding, and sleeping rooms or in a foul w.c."

Dr. Jones refers to the incomplete mortality tables for seamen published by the Board of Trade and the Registrar-General respectively. The Board returns give no idea of the fatality of certain diseases among seamen because the deaths only refer to so-called bona-fide seamen who die at sea and to those who are discharged from their ships on account of illnesses or

injuries which prove fatal. Dr. Jones does not think that more than 10 per cent. of the deaths of seamen from tuberculosis are included in the Board's returns. He sums up the position by saying that the time is long overdue for a thorough revision of standards and of sickness statistics of seamen in the mercantile marine.

SMOKE ABATEMENT.

THE chief obstacle in the way of public health authorities who desire to effect an abatement of the smoke nuisance within their areas is contained in Section 91 of the Public Health Act, 1875 (repeated in Section 24 of the Public Health London Act, 1891), wherein it is laid down that before smoke can be deemed to be a nuisance within the terms of the Act it must be "black" smoke. A factory chimney, whether in London or elsewhere, may belch forth volumes of dense, acrid, brown smoke of a suffocating character and in quantities which cause a pall to hang over the neighbourhood, and yet, under the terms of existing Public Health Acts, no notice can be served by the local authorities. It is possible that some manufacturers deliberately dilute their black smoke with steam in order to keep within the letter of the law. The Public Health (Smoke, &c., Abatement) Bill, introduced by Dr. A. Salter in the House of Commons on Dec. 10th, provides that any chimney emitting smoke in such quantity as to be a nuisance shall be deemed to be a nuisance notwithstanding that the smoke is not black smoke. Dr. Salter's Bill further provides that the term smoke shall include soot, ash, grit, and gritty particles. At present a chimney may emit immense quantities of thick dust or grit which may descend and cover everything in the neighbourhood with a heavy layer of dust, yet the offender cannot be dealt with because his chimney had not given forth black smoke. In order to have some criterion in case of prosecution the Bill provides that every local authority shall make by-laws prohibiting the emission of smoke in excess of a standard fixed by the Minister of Health, and the Minister is directed to fix such standard to which every local authority shall have regard when making the by-laws. It is intended that the Minister shall issue a colour test card to guide the inspector in making his observations and in deciding on a prosecution. Such graded cards are already well known in public health circles. Present penalties for contravention are too trivial to command attention from big manufacturers; increases are suggested from £5, £2, and 10*s*. to £50, £5, and £1 respectively. In London the suggested authority for the administration of the Act is made the London County Council rather than the borough councils, which are more susceptible to pressure from ratepayers and factory owners. A chimney is defined as including smoke-stacks, structures, or openings of any kind whatsoever capable of emitting smoke, as in the past there have been technical difficulties under this head. Chimneys of private dwelling-houses are specifically excluded, as the promoters of the Bill do not deem it practicable at the present time to issue a general prohibition of open coal fires. Should the low carbonisation treatment of coal at the pithead, the extraction of by-products, and the production of smokeless fuel become an economic possibility, the Act could be extended to deal with domestic chimneys. Section 4 of the new Bill runs: "It shall be the duty of a local authority on submitting proposals for the provision of houses for the purposes of the Housing Acts, 1890 to 1924, to satisfy the Minister that suitable arrangements are to be made for heating or cooking as are calculated to prevent or reduce the emission of smoke." In several recent housing schemes arrangements have been made either for (1) the complete elimination of coal fires and the substitution of gas or electricity for heating, or (2) central heating on the Dundee system. Outside London the County Council is to be given power to supersede any local authority which fails to carry out its duties under the Act of 1875. Any local authority is also to receive power in coöperation with manufacturers or others: (1) to inquire into or devise upon the methods employed in the prevention of smoke and the treatment of smoke in manufacturing operations, and as to the heating arrangements of large buildings; and (2) to arrange for the training of stokers in the best method of stoking. Certain authorities in the North have voluntary schemes on these lines without statutory sanction. Section 3 of the Bill provides for the extension of the list of noxious and offensive gases as enumerated by Section 27 of the Alkali, &c., Works Regulation Act, 1906. The Minister of Health may, after a public inquiry and after consultation with the local authorities or other interests concerned, make orders extending this list and amplifying the list of works mentioned in the first schedule of the Act. These are the main points in a Bill whose beneficent intent is beyond question.

A GRAPHIC SCHOOL REPORT.

IN his annual report for 1924 to the Cheshire County Council Dr. Meredith Young represents school medical service as by no means the dull, routine, wearisome work that it is sometimes painted, but as crowded with human interest. It is easy through his eyes to visualise the mother who "could not make" her child, aged 5 and suffering from "nerves," go to bed before she did; the parents whose children will not sleep in daylight; and the health visitors whose tact is tried to the utmost in efforts to convert "unclean" children into clean. The reported value of X ray for ringworm is generally accepted, but the statement that school lighting seems to affect the number of children with defective vision calls for statistical verification. A special inquiry into thyroid enlargement is of interest; the condition is most prevalent in the west and south of the county; at age 8 it is about equally prevalent in boys (2·3 per cent.) and in girls (2·5 per cent.), but at age 10 the percentages are 3·4 and 13·0 respectively, and at age 13, 4·0 and 16·0. Iodised salt is to be given a trial in the county. The rural child is reported not to compare favourably with the town child. "The rosy-faced, chubby country child is conspicuous by its absence. Instead we find children who are commonly pale, thin, and tired-looking . . . . overcrowding is very general and the older cottages are often vermin-ridden. . . . Villages send their milk, butter, and eggs to the large towns; there is not always left the supply sufficient for the villagers themselves." The children, badly shod, often walk in all weathers long distances on a hasty breakfast carrying with them a lunch of sorts. A dietary lacking in fresh vitamins is customary and anæmia is more prevalent than among town children; efforts to supply mid-day dinners are on foot. It is not a happy picture, but even so the rural child is rather better nourished and suffers less from rickets than the town child in the county. Bad clothing, poor nutrition, and unsatisfactory home conditions are found highly correlated; nevertheless, continued unemployment has not exerted an adverse effect on child physique. Rheumatism was found "equally common in urban and rural districts, in hilly and low-lying country; . . . it may well be considered pandemic." A positive correlation is reported between the stigmata of rickets and those of acute rheumatism. "I would almost hesitate," writes Dr. Young, "to diagnose a rheumatic condition in their absence." The combination of brilliant mentality and debilitating rheumatism is not uncommon, and a vicious circle is established when the child prefers to sit at home reading. Over-scholarship, combined with lowered vitality, is a real danger to these future brains of the country. Such problems are no doubt present in large measure in other parts of the country, but they are set out very pointedly in the report of the chief school medical officer for Cheshire.

PHYSICAL RESEMBLANCE AS EVIDENCE IN CASES OF DISPUTED PATERNITY.

THE Scottish law courts have once more rejected evidence of physical resemblance between child and alleged parent in a case where paternity is in dispute. In preliminary proceedings in his claim to the Seafield peerage Mr. Alexander Grant, who seeks a judicial declaration that he is the eldest lawful and legitimate son of the seventh Earl of Seafield, proposed to offer evidence that not only he himself but also his daughter and other members of his family resembled his alleged parents in feature, gait, and personal mannerisms. Lord Ashmore made an interlocutory order excluding these averments; from that order Mr. Grant appealed, but the Second Division of the Court of Session has (according to a report in *The Times* of Dec. 19th) dismissed his appeal with costs. It will be recalled that ten years ago in the Slingsby case an attempt was made to establish in the English High Court the legitimacy of a boy of 4 years of age by offering evidence inter alia of physical similarities between the child and his reputed parents. On appeal the House of Lords did not look with much enthusiasm upon evidence of this kind; Lord Shaw in particular, speaking with the authority of a Scottish lawyer, pointed out that in Scotland such evidence had been rejected for more than a century on the ground that it was "loose and fanciful," and added that in England it was open to the same objection. In the Seafield peerage claim Lord Anderson repeated Lord Shaw's two epithets, while the Lord Justice Clerk commented on the remoteness of investigating alleged resemblances unto the third and fourth generation. It was proposed, he said, to find resemblances to her grandfather in a grand-daughter. When he surveyed the vista opened up by these averments, he thought in Prof. Bell's phrase, that the situation would make wild work of the law of legitimacy. English law is not quite so rigid as Scots law in excluding evidence of this kind. It will be remembered that photographs were produced in the Russell divorce case to suggest the resemblance of baby to father, and that in the Slingsby case Sir George Frampton, the sculptor, acted as a kind of informal assessor in assisting the judge to detect details of physical similarity. English law seems to allow that, in cases of disputed paternity, the phenomenon of facial resemblance between parent and child is one which a jury may take into account and may weigh along with other evidence. But even English law must draw the line somewhere, and if in an English court it was sought to trace this resemblance through three or four generations, the judge, if he did not exclude the evidence altogether, would doubtless warn the jury not to pay too much attention to it.

PARATHYROID EXTRACT.

IN discussing the treatment of spasmophilia in young children in THE LANCET of Dec. 12th last, Dr. J. C. Spence commented on the recent work of J. B. Collip and his collaborators in the preparation of an extract from parathyroid glands and in the experimental demonstration of its active properties. In the early part of this year Collip published [1] the method of preparation. This consists in collecting fresh parathyroids from oxen and, after dissection, freezing them at −4° C. The active substance is prepared by extracting the glands with 5 per cent. HCl in a boiling water bath. On cooling, the fat is skimmed off and the fluid is rendered alkaline by the addition of caustic soda solution. Hydrochloric acid is added very carefully until the maximum precipitation of proteins at the iso electric point occurs. This precipitate is separated off, redissolved in alkali, and the procedure is repeated. All the solutions are combined, and herein lies the active principle. The administration of this substance, either by mouth, subcutaneously or intravenously, causes a marked increase in the blood calcium. The actual quantity injected does not seem to matter, but frequency is of the utmost importance. Injection into a parathyroidectomised animal in tetany resulted in rapid cure. Very remarkable general results are described; the viscosity of the blood is greatly increased, the osmotic pressure + 10 per cent., phophates + 100 per cent., non-protein nitrogen up to 400 per cent., blood halogens are decreased 10 to 15 per cent. Cases of infantile tetany and of œdema due to acute nephritis were greatly assisted by the extract. Collip stated [2] that it was possible to kill an animal through hypercalcæmia, the blood calcium rising to 29 mg. per 100 c.cm. In his earlier papers Collip maintained that the substance was of a simple nature, but in later contributions he expresses the opinion that it is probably a complex substance. In later papers the rises in blood calcium content induced by the injection of the extracts are not so great as those described in the earlier papers. The provision of a standardised reliable extract of parathyroid for therapeutic purposes is probably now a matter of time only, though, as we pointed out recently (THE LANCET, 1925, i., 89), it will take many animals to meet even a small clinical demand.

[1] Amer. Jour. Physiol., 1925, lxxii. (Proc. Amer. Physiol. Soc.), 182; Jour. Biol. Chem., 1925, lxiii., 39.

PART II. of the Registrar-General's Statistical Review, giving civil tables of statistics for the year 1924, price 5*s*., is now on sale at H.M. Stationery Office. It follows close on Part I., recently noticed in our columns, and gives tables of population, of births, of infant mortality, of marriages and places of their solemnisation, for different parts of England and Wales. Public health officials will find it indispensable to consult the tables in Part II. as well as in Part I. for serious study of the vital statistics of their own and other areas. This volume also gives the number of Parliamentary and local government electors in each area of England and Wales. Part III. has still to appear.

AT a recent meeting of the managers of the Royal Infirmary, Edinburgh, reference was made to the retirement from the active staff of Sir Norman Walker, and a minute of thanks and appreciation was read, setting out his association with the infirmary as house physician in 1885, assistant physician for diseases of the skin from 1892–1906, and full physician in the skin department from 1906–1924. The minute goes on: "As treasurer of the Royal College of Physicians, as a member of the General Medical Council, as a medical educationist, and in many other positions of professional responsibility, Dr. Walker exhibited also great administrative and business qualities, and has played a leading part among his contemporaries." In conclusion the managers invited Sir Norman Walker to remain as consulting dermatologist to the Royal Infirmary.

[2] Collip, J. B., Clark, E. P., and Scott, J. W.: Jour. Biol. Chem., 1925, lxiii., 439; Collip and Clark: Ibid., 1925, lxix., 185.

MIDDLESEX HOSPITAL.—The rebuilding fund has now reached £259,000, a fraction over half the estimated cost of £500,000. The women of the Empire are being asked to contribute £50,000 for the Queen Alexandra Memorial Wing. The old Alexandra Ward, which sheltered French refugees during the Revolution, is about to be closed. A complete wireless installation for the 90 beds of the hospital's cancer charity was last week presented by the Wireless for Hospitals Fund.

HOSPITAL POLICY OF THE LABOUR PARTY.—At a conference of the provincial centre of the National Union of Trade Union Approved Societies at Manchester last week a report was presented from the Research Department of the Labour movement on the work of voluntary hospitals. The report declared that the present methods of workers' contributions, patients' payments, and letters of recommendation from lay subscribers are "unfair and objectionable," and that the hospitals ought to be "financed from the rates with substantial grants-in-aid from the National Exchequer." Consideration of the report was postponed.

Modern Technique in Treatment.

A Series of Special Articles, contributed by invitation, on the Treatment of Medical and Surgical Conditions.

CLIII.—MASTURBATION IN YOUNG WOMEN.

THE term masturbation is here used to cover all means employed in order to experience, through the individual's own body, pleasure which is normally gained in sex intercourse. These means include manipulation of the genitals manually or with instruments, crossing and rubbing the thighs, and indulgence in erotic phantasies without handling the genitals.

When a patient presents herself for treatment, our first concern is to help her to understand the true significance of the habit, for it is merely an outward sign that mental and spiritual development have not advanced hand in hand with physical development. It is permissible for the small child to love his own body and all the pleasures associated with its functioning, but if the growing girl and young woman are to add each her contribution to the evolution of the race, then they must forsake the paths of childhood, where self-love is the dominant note, and advance to a new viewpoint from which they have vision of personal insignificance in comparison with racial development. That this is a true interpretation is proved by the patient's attitude of childish evasion of all the problems of life, and the extreme disharmony into which she is thrown by the ever-recurring remorseful conflict provoked by indulgence in what she regards as a sinful habit. Our duty it is to help her to achieve harmony by facing responsibilities, great and small, and by directing all her faculties in unison to the art of living. A thorough physical examination is absolutely essential in this as in all psychological states, since high endeavour may be brought to naught by the backward pull of physical debility. Any weight or tension in the pelvis must be relieved by attention to constipation, to tight clothing (including the present-day weight-reducing rubber corsets), and to dysmenorrhœa. The latter point is of extreme importance, as the period of congestion preceding the onset of the menses is a critical time, during which an orgasm may occur in sleep, even if temptation has been resisted by day.

Before entering on further details of treatment, it is helpful to trace the habit back to its roots, which may be in early childhood or in girlhood. This at once destroys the plea put forward by the patient that she is helpless in the grip of an inborn or, as she may say, hereditary weakness, against which resistance is futile, and thus she can be led to accept personal responsibility. And investigation of the origin of the habit may in other ways prove helpful. In one case, for instance, a patient, badly in the grip of masturbation, expressed great disgust at the obsessive power in her thoughts of enema-syringes in association with certain shops in Charing Cross-road, where these and other appliances are displayed. On carrying back her thoughts to childhood, her earliest recollections of self-abuse were found to be inseparable from the administration of enemata for an extreme degree of constipation. An enema syringe was thus found to be (in the subconscious) not a thing she hated but the motif of her sex-phantasies and the instigator of indulgence. The Charing Cross-road shops were also proved to give, in reality, an additional fillip to her phantasies, and to heighten the pleasure of masturbation.

Early to bed and early to rise is an excellent adage to recommend, while the tonic effect of a morning cold plunge (for those who react with an exhilarating glow) is undoubted. A sedentary life sets an obstacle in the path of progress, not only because it produces, or retards recovery from, constipation, but also because periodically it gives rise to a pent-up feeling which demands an outlet and finds it most easily through indulgence in masturbation. Although the opposite point of view has been put forward—i.e., that an exhilarating walk has a provocative effect on one who is predisposed to masturbate, it is the general experience that subsequent fatigue negatives the initial sense of desire (should it occur), so that we can confidently recommend physical exercise in excess.

Strict avoidance of enervating atmospheres (moral as well as material), of openly or subtly erotic literature, plays and conversation, must be earnestly urged, so long as the patient is still traversing marshy ground, since these may turn victory to defeat. Many women have found, to their dismay, that intellectual work which has not proceeded smoothly is apt to provoke sex feelings. If this be the experience of the patient under treatment, then every effort must be made to reorganise her life till she is on terra firma. But it is absolutely essential that the alternative work suggested should demand a keen coördination of all her energies in achievement and thus provide an adequate outlet for her sex urge.

It may be well to repeat here, what has been said often before, that the modern psychological attitude towards masturbation as retarded development and not a sin must be made very clear to the patient, since the object of treatment is to concentrate on development and to discourage the negative attitude of resistance to temptation and remorse over failure. It is frequently necessary to repeat the explanation with varied phraseology and, as the patient's confidence is gained, to drive it home with illustrations gleaned from her own account of struggle and failure. However much we endeavour to capture the patient's imagination with the lure of an adventure in development, she must at the same time feel the support of practical ideas. To one patient, incredibly childish in her outlook on life, the suggestion was made to attack the problem of growth by making a list of minor evasions of responsibility. Among them she included: failure to brush the teeth regularly, inability to rise when wakened, dawdling over dressing, and unpunctuality.

Many authorities have advocated manual, outdoor labour as the most satisfactory solution for refractory cases, but it is possible, when such an arrangement is not feasible, to provide the right atmosphere in quite other surroundings, as proved by a report received recently from a woman of 41 who had masturbated since childhood, and for some years earned her living with the minimum of effort in wealthy families. Writing from the institution in which, at the suggestion of the writer, she had accepted work, she said the life there had been incredibly hard and even painful, but that never once, since her arrival six weeks previously, had she even experienced any temptation to masturbate.

From these few suggestions on treatment, it is obvious that atmosphere is the most important element in successful handling, and that even at the first interview the patient should, so to speak, experience the tonic effect of a bracing wind. Everything depends on the physician's capabilities as regards successful investigation, initiative to meet the needs of individual cases, or even the varying needs of one case, sympathetic understanding which begets confidence, and a certain driving force which carries the patient along and which both inspires and energises her. The response to treatment is sometimes very rapid, but some cases make a grave demand upon the physician's patience, initiative, and staying power.

Certain views which are frequently put forward upon the subject of masturbation demand critical attention. Some, for instance, contend that the harmfulness of masturbation is grossly exaggerated, and that it serves a useful end in providing an outlet for sex feelings till marriage becomes possible. Three objections can be opposed to this contention. (*a*) That the injuriousness of the habit consists in the fact already pointed out, that it is an indication of arrest of growth, whereas the world has need of men and women who have attained to the full stature of development; (*b*) that the social ideal to be aimed

at is an increasing inter-dependence of the sexes, whereas masturbation renders a woman sexually independent of men; (c) this independence may, later, wreck a woman's chances of married happiness, for some women have, even early in married life, fallen back on masturbation because through it they experienced greater satisfaction. Others suggest that an outlet should be found in an irregular union, but overlook the fact that this is a pitiful evasion and not a solution of the patient's problem, if we accept it to be one of growth. Such a course inevitably increases the sense of conflict and disharmony, and brings with it an added burden of secrecy. Still others put forward what appears to be a plausible suggestion in advising the woman to avail herself of an opportunity of marrying, marriage being thus offered as a cure for masturbation. This is surely a poor conception of marriage. If we hold the function of wifehood and motherhood in high esteem, is it not well that the woman in question should first put from her childish things and plough the furrow of self-education with earnestness of purpose, before she attempts the difficult task of adjustment to marriage and motherhood? Also, in view of the fact that marital intercourse may offer a lesser satisfaction than masturbation, is it not better that the woman should first on her upward climb arrive at the point where she discovers that the habit of masturbation has fallen from her life as a worn-out and useless garment? For in some such words has many a one expressed to me the consciousness of increase in mental and spiritual stature.

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Special Articles.

KING EDWARD'S HOSPITAL FUND FOR LONDON.

A MEETING of the President and General Council of King Edward's Hospital Fund for London, for the purpose of awarding grants to the hospitals and convalescent homes for the present year, was held at St. James's Palace on Dec. 15th under the presidency of the Prince of Wales.

Death of H.M. Queen Alexandra.

Lord Stuart of Wortley (Chairman of the Management Committee) moved the following resolution:—

"That the General Council of King Edward's Hospital Fund for London desire to record their deep sorrow at the death of Her Majesty Queen Alexandra, and their sense of the great loss which all connected with hospitals, in common with the rest of the nation, have suffered thereby. The Council desire respectfully to tender to His Majesty the King, Patron of the Fund, and the Royal Family, their heartfelt sympathy in the sad bereavement which has befallen them, and to offer the humble assurance of their loyalty and devotion."

Lord Somerleyton (hon. secretary) seconded the resolution which was carried unanimously, the Council rising in their places.

The Financial Position.

Lord Revelstoke (the hon. treasurer) said that it had been decided that the total of the ordinary distribution should be increased from £235,000 to £245,000, while it was also proposed that the special grants which they were able to distribute as the outcome of the legacies of the late Mr. and Mrs. Wells should amount to £57,000, the two distributions together making a total of £302,000. The increased distribution of £245,000 would be provided out of the income for the current year. Receipts from legacies were again considerably below the average; but, on the other hand, the Fund had received some most timely donations, including £6000 and £2250 from donors who wished to be anonymous, in addition to £5000 from Lady Strathcona. The British Charities Association, which gave £15,000 last year for distribution amongst hospitals in London, had this year given £20,000. A further amount of £85,485 10s. in connexion with the estate of Lord Mount Stephen had also been received. Apart from considerable funds retained for certain annuities, to which the Hospital Fund would be entitled to an eventual reversion, the sum he had the pleasure of reporting as already actually received in this connexion was no less than £666,889. A further £4500 had also been received from the estate of Mr. Samuel Lewis. These sums had, like previous receipts from the same sources, been placed to capital account. From the Wells Legacies, which were estimated at £200,000, the amount received to date was £162,240. If this year's grants were added to last year's, the total allocated so far was £138,000.

League of Mercy.

Sir William Collins, in making the annual statement on behalf of the League of Mercy, said the League approved the policy in regard to contributions from patients, so far as they were voluntary thank-offerings; but they associated themselves with Lord Cave's Committee in the hope that the policy would not work to the detriment of the indigent sick or prevent the admission of the very poor for whom the hospitals were primarily intended. So far as it was possible to estimate from the amounts already received, the League would be in a position this year to hand over £15,000 to the King's Fund, which was £500 more than last year. That would make the total of the contributions by the League of Mercy to the King's Fund £383,034. In addition, they were making grants of £9845 to extra-metropolitan hospitals, and in that they had to acknowledge the assistance of the British Charities Association, which gave £5000 towards that distribution. That made a grand total of the amount distributed by the League of Mercy in its 26 years to voluntary hospitals of £457,084.

Grants to Hospitals and Convalescent Homes.

The Chairman of the Distribution Committee (Sir Cooper Perry) presented the report of the Committee on the distribution to hospitals (including recovery and convalescent branches). The report stated that the amount placed at the disposal of the Distribution Committee for allocation amongst hospitals and their recovery and convalescent branches at the present distribution was £243,000, as against £233,000 last year. The number of hospitals applying for grants was 133, as against 118 in 1924. Taken as a whole, the hospitals continued to maintain in 1924 the improved financial position which had been gradually reached since the crisis in 1920, but additions were being made to the number of beds available, and the Distribution Committee found it necessary to make a considerable increase in the amount allocated to maintenance grants, the total being £214,075, as against £197,275 in 1924.

Prof. Winifred Cullis seconded the report, which was adopted.

Major Wernher (hon. secretary) presented the schedule containing the list of awards to hospitals (including recovery and convalescent branches) as follows:—

*List of Awards.**

	£
Acton Hospital (of which £500 to deficit on extension, in accordance with the scheme submitted to the Fund)	1,000
All Saints' Hospital	50
Babies' Hospital (Deptford Fund)	25
Baby Clinic Hospital (Kensington)	25
Beckenham Cottage Hospital	400
Belgrave Hospital for Children (of which £1000 towards the provision of new nurses' accommodation, in accordance with the scheme submitted to the Fund)	2,350
Blackheath and Charlton Hospital (of which £50 towards kitchen improvements)	250

* The Distribution Committee draw attention to the fact that it must not be assumed that the reduction or absence of a grant implies dissatisfaction.

	£
Bolingbroke Hospital (of which £1000 towards erection of new ward block, in accordance with the scheme submitted to the Fund)	2,350
Brentford Cottage Hospital (of which £500 towards rebuilding and extension on new site, in accordance with the scheme submitted to the Fund)	525
British Hospital for Mothers and Babies, Woolwich	500
Bromley Cottage Hospital	100
Carshalton and District Hospital	100
Central London Ophthalmic Hospital	600
Central London Throat and Ear Hospital	150
Charing Cross Hospital	4,000
Chelsea Hospital for Women (including Convalescent Home at St. Leonards)	875
Cheyne Hospital for Children (including Country Branch at St. Nicholas-at-Wade) (of which £250 towards increased accommodation for artificial sunlight treatment and other improvements, in accordance with the scheme submitted to the Fund)	500
City of London Hospital for Diseases of the Heart and Lungs (Victoria Park) (including Convalescent Home at Saunderton)	3,850
City of London Maternity Hospital	1,250
Clapham Maternity Hospital	350
Dreadnought Hospital (Seamen's) (including Albert Dock Hospital, Hospital for Tropical Diseases, Sanatorium at Liphook, and Convalescent Home at Cudham) (of which £100 towards provision for artificial sunlight at the sanatorium at Liphook)	2,650
East End Mothers Lying-in Home (of which £1000 towards acquisition of adjoining building and its adaptation for nurses' quarters, in accordance with the scheme submitted to the Fund)	1,500
East Ham Hospital	150
East London Hospital for Children (including Convalescent Home at Bognor) (of which £100 to complete the extension and improvement of the X ray department)	3,350
Elizabeth Garrett Anderson Hospital (including Recovery Branch at Barnet) (of which £1000 towards extension, in accordance with scheme to be approved by the Fund)	2,725
Eltham and Mottingham Cottage Hospital	25
Enfield War Memorial Hospital	200
Evelina Hospital	1,000
Finchley Memorial Hospital	275
Florence Nightingale Hospital for Gentlewomen	300
Forest Hospital, Buckhurst Hill	175
French Hospital	350
General Lying-in Hospital	650
German Hospital	350
Gordon Hospital for Fistula	50
Grosvenor Hospital for Women (of which £500 towards provision of accommodation for resident medical officer and for nurses, in accordance with scheme to be approved by the Fund)	1,000
Guy's Hospital (of which £2000 towards recent improvements)	12,500
Hampstead General and North-West London Hospital (of which £250 towards improvements, in accordance with the scheme submitted to the Fund)	3,000
Hanwell Cottage Hospital (of which £25 towards provision of X ray department, in accordance with the scheme submitted to the Fund)	75
Hendon Cottage Hospital (of which £250 towards extension of ward block, in accordance with the scheme submitted to the Fund	550
Hornsey Cottage Hospital (of which £100 to deficit on extension, in accordance with the scheme submitted to the Fund)	250
Hospital for Consumption, Brompton (including Sanatorium at Frimley) (of which £250 towards removal of X ray department from basement, in accordance with the scheme of improvements submitted to the Fund)	1,250
Hospital for Diseases of the Throat	100
Hospital for Epilepsy and Paralysis (of which £500 towards extension of in-patient department, in accordance with the scheme submitted to the Fund)	2,250
Hospital for Sick Children	4,000
Hospital for Women (Soho-square)	1,000
Hospital of St. John and St. Elizabeth	750
Ilford Emergency Hospital	300
Infants Hospital (of which £150 to reduce debt)	500
Invalid and Crippled Children's Society Hospital (Canning Town) (of which £250 towards extension of out-patient department, in accordance with the scheme of extension submitted to the Fund)	700
Italian Hospital	300
Jewish Maternity Home	35
Kensington Dispensary and Children's Hospital (of which £500 towards removal and extension, in accordance with scheme to be approved by the Fund)	525
Kensington, Fulham, and Chelsea General Hospital (of which £1000 towards rebuilding and extension, in accordance with the scheme submitted to the Fund)	1,100
King Edward Memorial Hospital (Ealing)	500
King Edward VII.'s Hospital for Officers	250
King's College Hospital	7,500
Kingston-upon-Thames Victoria Hospital	100
London Fever Hospital (of which £25 towards ward kitchen)	525
London Homœopathic Hospital	1,750
London Hospital (including Recovery Branch at Reigate) (of which £1,000 to improvements, in accordance with the scheme submitted to the Fund)	14,625
London Jewish Hospital (of which £500 towards extension, in accordance with the scheme submitted to the Fund)	750
London Lock Hospital (of which £500 to maintenance of Harrow-road hospital and £100 to maintenance of Dean-street hospital, and £1000 towards the building of an extension of the out-patient department at Dean-street, in accordance with scheme to be approved by the Fund)	1,600
London Temperance Hospital (of which £750 to reduction of debt)	2,500
Maternity Charity and District Nurses' Home (Plaistow) (to the hospital: of which £250 to deficit on rebuilding and extension, in accordance with the scheme submitted to the Fund)	650
Medical Mission of the Good Shepherd, Babies' Home (Hoxton) (of which £25 to maintenance of babies' ward, and £25 towards improvements)	50
Metropolitan Ear, Nose and Throat Hospital	25
Metropolitan Hospital (of which £2000 towards new nurses' home, in accordance with the scheme submitted to the Fund)	6,000
Middlesex Hospital (including Convalescent Home at Clacton)	7,400
Middlesex Hospital Cancer Charity	1,000
Mildmay Memorial Hospital	450
Mildmay Mission Hospital (of which £500 towards nurses' home, in accordance with the scheme submitted to the Fund)	1,700
Miller General Hospital for South-East London (including Convalescent Home at Bexhill) (of which £1650 towards extension, in accordance with the scheme submitted to the Fund)	5,225
Mothers' Hospital of the Salvation Army (of which £400 to deficit on extension, in accordance with the scheme submitted to the Fund)	900
Mount Vernon Hospital (Fitzroy-square and Northwood)	1,200
National Hospital for Diseases of the Heart (of which £500 towards extension of out-patient department, in accordance with the scheme submitted to the Fund)	800
National Hospital for the Paralysed and Epileptic (including Convalescent Home at Finchley)	4,000
Nelson Hospital (South Wimbledon) (of which £250 to deficit on extension, in accordance with the scheme submitted to the Fund)	950
Northcourt Hospital and Home for Sick Children (Hampstead) (in consideration of the fact that curable cases are admitted)	75
North Islington Infant Welfare Wards	50
Norwood and District Cottage Hospital	450
Paddington Green Children's Hospital (including Convalescent Home at Slough)	1,100
Passmore Edwards Hospital for Wood Green, &c.	100
Phillips Memorial Homœopathic Hospital, Bromley	15
Poplar Hospital for Accidents (including Convalescent Home at Walton-on-the-Naze) (of which £250 towards new nurses' home, in accordance with the scheme submitted to the Fund)	475
Prince of Wales's General Hospital (including Convalescent Home at Nazeing) (of which £500 to reduce debt and £100 towards new mortuary, in accordance with the scheme submitted to the Fund)	5,200
Princess Louise Kensington Hospital for Children (*see* Kensington Dispensary and Children's Hospital)	
Queen Charlotte's Maternity Hospital (of which £500 to reduce debt)	2,000
Queen Mary's Hospital for the East End (including Convalescent Home at Theydon Bois)	4,150
Queen's Hospital for Children (including Convalescent Home at Bexhill)	4,250
Royal Dental Hospital of London	250
Royal Eye Hospital	750
Royal Free Hospital (of which £1000 to reduce debt)	6,000
Royal Hospital (Richmond) (of which £250 towards extension, in accordance with the scheme submitted to the Fund)	1,000
Royal London Ophthalmic Hospital (of which £500 to reduce debt)	3,500
Royal National Orthopædic Hospital (including Country Branch at Stanmore) (of which £1000 towards extension of out-patient department, in accordance with the scheme submitted to the Fund)	5,500
Royal Northern Hospital (including Royal Chest Branch in City-road, Recovery Branch at Southgate, and Convalescent Home at Clacton) (of which £750 to reduce debt, and £500 towards additional heating apparatus, in accordance with the scheme of extensions and improvements submitted to the Fund)	8,700
Royal Waterloo Hospital for Children and Women (including Convalescent Home at Whippingham) (of which £1000 towards new nurses' accommodation, in accordance with the scheme submitted to the Fund)	3,275
Royal Westminster Ophthalmic Hospital	650
St. Andrew's Hospital (Dollis Hill)	250
St. Bartholomew's Hospital (of which £1000 towards new nurses' accommodation)	7,000
St. Columba's Hospital	350
St. George's Hospital (including Recovery and Convalescent Branch at Wimbledon)	7,000
St. John's Hospital (Lewisham) (of which £100 towards extension of out-patient department, in accordance with the scheme submitted to the Fund)	1,100
St. John's Hospital (Twickenham)	100
St. John's Hospital for Diseases of the Skin (of which £100 towards improvements, in accordance with the scheme submitted to the Fund)	400

	£
St. Luke's Hospital for Advanced Cases (of which £100 towards extension of nurses' accommodation)	400
St. Mark's Hospital (of which £250 towards extension of out-patient department, in accordance with the scheme submitted to the Fund)	550
St. Mary's Hospital	6,000
St. Mary's Hospital for Women and Children (Plaistow) (of which £250 to deficit on new nurses' home, in accordance with the scheme submitted to the Fund)	2,000
St. Monica's Home Hospital	100
St. Peter's Hospital for Stone (of which £250 towards new lift)	600
St. Saviour's Hospital for Ladies of Limited Means (Osnaburgh-street) (of which £100 towards improvements)	225
St. Thomas's Hospital (of which £1000 to improvements)	11,000
Samaritan Free Hospital for Women (including Convalescent Home at Amersham)	1,300
Santa Claus Home	75
Seamen's Hospital Society (*see* Dreadnought Hospital)	
South-Eastern Hospital for Children (Sydenham) (of which £750 towards new nurses' home, in accordance with the scheme submitted to the Fund)	1,550
South London Hospital for Women (of which £500 towards new out-patient department, in accordance with scheme to be submitted to the Fund)	1,500
Stoke Newington Home Hospital for Women	75
Streatham Babies' Hospital	25
University College Hospital (of which £1000 to reduce debt)	8,500
Victoria Cottage Hospital (Barnet)	100
Victoria Hospital for Children (including Convalescent Home at Broadstairs)	2,700
Walthamstow, Wanstead, and Leyton Children's and General Hospital (of which £1000 towards extension, in accordance with the scheme submitted to the Fund)	1,900
Weir Hospital, Streatham	100
West End Hospital for Nervous Diseases	1,600
Western Ophthalmic Hospital	300
West London Hospital	5,500
Westminster Hospital (of which £1000 to reduce debt)	6,150
Willesden General Hospital	1,750
Wimbledon Hospital (of which £200 to deficit on new nurses' home, in accordance with the scheme submitted to the Fund)	550
Winifred House Invalid Children's Convalescent Hospital Home	25
Woodford Jubilee Hospital	75
Woolwich and Plumstead Cottage Hospital	25
Woolwich and District War Memorial Hospital Building Fund (special grant towards provision of general hospital, in accordance with the scheme submitted to the King's Fund)	1,000
Total	£243,000

Summary.

Total Grants to Hospitals (including Recovery and Convalescent branches) out of the ordinary distribution	243,000
Total Grants to Hospitals, January to December, 1925, out of the special distribution of the legacies of the late Mr. and Mrs. Wells	57,000
Total grants to hospitals and branches	£300,000

The motion was put and carried unanimously.

Distribution to Convalescent Homes.

The Chairman of the Distribution Committee (Sir Cooper Perry) then presented the report of the committee on the distribution to convalescent homes not attached to particular hospitals, which stated that the President and General Council had fixed the sum available for distribution amongst convalescent homes not attached to any particular hospital in London at £2000, being the same amount as last year. The number of applications eligible for consideration amounted to 42, also the same as last year.

Lists of Awards.

The list of grants were presented by Major-General Sir Cecil Lowther (hon. secretary) as follows:—

	£
All Saints' Convalescent Hospital (Eastbourne)	200
All Saints' Convalescent Home (St. Leonards)	25
Baldwin Brown Convalescent Home (Herne Bay)	25
Bean Site Convalescent Home (Hastings)	25
Brentwood Convalescent Home for London Children (Brentwood)	25
Brooklands Home (Invalid Children's Aid Association) (Worthing)	50
Bushey and Bushey Heath Children's Convalescent Home (Bushey)	25
Children's Convalescent Home (Beaconsfield)	25
Children's Cottage Hospital (Cold Ash, Newbury) (in consideration of the fact that convalescent cases are admitted)	25
Children's Home Hospital (Barnet) (in consideration of the fact that convalescent cases are admitted)	25
Clevedon Sanatorium (Invalid Children's Aid Association) (Broadstsirs)	50
Convalescent Home for Children (Hawkenbury, Tunbridge Wells)	25
Convalescent Home for Poor Children (St. Leonards)	75
Convalescent Police Seaside Home (Hove)	75
Edgar Lee Home (Invalid Children's Aid Association) (Willesden)	50
Florence Emma Home (Invalid Children's Aid Association) (Dover)	25
Friendly Societies' Convalescent Home (Herne Bay)	25
Hamilton House (Invalid Children's Aid Association) (Seaford)	50
Home for Invalid Children (Brighton)	50
Kurandai Home (Invalid Children's Aid Association) (Hartfield, Sussex)	75
London and Ascot Priory Convalescent Home (Bracknell)	75
London and Brighton Female Convalescent Home (Brighton)	50
London Homœopathic Convalescent Home (Eastbourne)	25
Mental After-Care Association Homes (Fairlight)	150
Metropolitan Convalescent Institution (Bexhill, Broadstairs (Children) and Walton)	100
National Sunday School Union Convalescent Homes (Clacton)	50
Ranyard Mission Convalescent Home (St. Leonards)	25
St. Andrew's Convalescent Homes (Felkestone)	75
St. Andrew's Convalescent Hospital (Clewer)	50
St. John's Home (Kemp Town, Brighton)	50
St. Luke's Homes (Children) (Woodley, Reading) (in consideration of the fact that convalescent cases are admitted)	25
St. Mary's Convalescent Home (Birchington)	25
St. Mary's Home for Children (Broadstairs) (in consideration of the fact that convalescent cases are admitted)	50
St. Michael's Convalescent Home (Westgate)	50
Seaside Convalescent Hospital (Seaford)	75
Suffolk Convalescent Home (Felixstowe)	50
Sunshine Convalescent Home for Children (Felpham, Bognor)	25
Surgical Home for Boys (Banstead) (in consideration of the fact that convalescent cases are admitted)	25
Tilford Convalescent Home for Children (Farnham)	50
Victoria Home for Invalid Children (Margate) (in consideration of the fact that convalescent cases are admitted)	25
Total	£2,000

The motion, having been seconded by Lord Mildmay, was then put, and carried unanimously.

Wells' Legacies Distribution: Lists of Grants to December, 1925.

The Chairman of the Distribution Committee (Sir Cooper Perry) then presented the report of the committee on the special distribution to hospitals out of the Wells legacies to date, in aid of extensions, and Mr. Leonard L. Cohen (hon. secretary) presented the schedule containing the list of awards to hospitals out of the Wells legacies to date, as follows:—

Beckenham Cottage Hospital.—£3000 towards extension—viz., £1000 towards the deficit on the earlier stages of the scheme, increasing the number of beds from 25 to 40, £1000 to be payable on the completion and opening of the final stage, and £1000 to be the last £1000 required to free the whole scheme of debt; on condition that the final stage is put in hand by the beginning of October, 1925.

Belgrave Hospital for Children.—£2000 towards erection of new wing to be used temporarily for nurses' accommodation so as to enable the hospital to open 12 beds, thus increasing the number available from 62 to 74; to be the last £2000 required in order to secure a conditional donation of £10,000.

Bolingbroke Hospital.—£2500 towards extension from 60 beds to 92, to be the last £2500 to enable the extension to be opened free of debt, on the understanding that the balance is raised by the hospital and that, when the extension is opened, 10 beds will be reserved for accident cases.

Brentford Cottage Hospital.—£1000 towards the building of the new hospital, increasing the number of beds from 7 to 16; on condition that the contract is signed by Jan. 1st, 1926.

Invalid and Crippled Children's Society's Hospital.—£500 towards extension, increasing the number of beds from 28 to 40, as a grant to start the appeal for the scheme.

Jewish Maternity Hospital.—£1000 towards extension from 13 beds to 39, to be the last £1000 required to render the extension free of debt.

Kensington Dispensary and Children's Hospital.—£500 to first stage of rebuilding as Princess Louise Kensington Hospital for Children, on condition that beds are provided as well as an out-patient department.

King Edward Memorial Hospital, Ealing.—£2000 toward extension from 62 beds to 102; being £1000 to start the appeal for the scheme, and £1000 to be the last £1000 required to render the extension free of debt, without depleting the hospital's free capital, on the understanding that the work is put in hand by March 31st, 1926.

London Jewish Hospital.—£2500 towards extension, increasing the number of beds from 51 to 84, and including separate nurses' home and extension of out-patient department; £1250 of the grant to be payable when the nurses' home and out-patient department are begun, and £1250 when the whole scheme is finished.

London Lock Hospital.—£1000 towards the building of the extension of the out-patient department at the Dean-street Hospital.

Metropolitan Hospital.—£5000 towards new nurses' home and accident ward of 9 beds; to be payable as soon as a further £5000 has been raised by the hospital from other sources; on the understanding that the nurses' home will be put in hand by Jan. 1st, 1926, and that, when the ward is opened, 9 beds will be reserved for accident cases.

Middlesex Hospital.—£10,000 in July, 1925, as a first grant to the reconstruction scheme; and £10,000 in December, 1925, as a second grant.

Royal Free Hospital.—£1000 towards new children's ward providing 18 additional cots, on the understanding that, as a result of the consequent rearrangement of hospital beds, 9 beds will be provided for accident cases.

Royal Hospital, Richmond.—£1000 towards extension, increasing the number of beds from 66 to 82; to be the last £1000 required to enable the extension to be opened free of debt; on the understanding that the balance is raised by the hospital without drawing on investments now held for other purposes, and that, when the extension is opened, 4 beds will be reserved for accident cases.

Royal National Orthopædic Hospital.—£5000 towards extension of out-patient department at Great Portland-street; to be the last £5000 required to enable the extension to be opened free of debt, on condition that the work is put in hand by Jan. 1st, 1926; and £3000 towards extension of country branch at Stanmore from 100 beds to 252, to be the last £3000 required to complete the first £40,000 for the scheme; subject to the conditions of the grant of £5000 to the out-patient department extension being fulfilled first.

Royal Waterloo Hospital for Women and Children.—£3000 towards final stage of extension scheme, including new nurses' accommodation, to be the last £3000 required to enable the extension to be opened free of debt.

Willesden General Hospital.—£3000 towards extension, increasing the number of beds from 78 to 100; to be the last £3000 required to open the whole building free of debt; on the understanding that the balance is raised by the hospital without drawing on general fund cash or investments, and on condition that the new ward block is put in hand by the middle of October, 1925, and that, when the ward block is opened, 8 beds will be reserved for accident cases.

The total grants to December, 1925, were therefore £57,000, and the number of additional beds to be provided 396. The number of beds to be reserved for accident cases totalled 40.

Sir Walter Lawrence, Bart., having seconded, the motion was put and carried.

The Prince of Wales here read a message sent by His Majesty the King, the Patron of the Fund, which was as follows:—

"The King is glad to hear that the Fund has been able to increase its distribution from £235,000 to £245,000, and that with the extended area of its operations it now makes grants to no fewer than 133 hospitals. His Majesty is grateful to Lord Stuart of Wortley for all he has done as chairman of the Management Committee, and, indeed, ever since the foundation of the Fund, of which he was one of the original honorary secretaries."

Remarks by the Prince of Wales.

Continuing, the Prince of Wales said that the distribution this year covered a wider field than ever before, for the King's Fund area was now 380 square miles instead of 255, while the number of hospitals helped had gone up from 118 to 133. The amount of the ordinary distribution had increased from £235,000 to £245,000, apart from the grants out of the Wells legacies. The combined total was £302,000. The ordinary distribution of £245,000 came from various sources. About two-thirds of it was secured by income from investments under the care of Lord Revelstoke and the Finance Committee. But about £82,000 had to be raised in the year. The annual subscriptions had always been smaller than hoped for, but this year they showed a welcome increase, largely in the form of seven-year agreements, many of them so worded that the subscriber gave the King's Fund the benefit of any income-tax saved by the agreement. The League of Mercy provided, as usual, a large sum, made up of innumerable small ones, while donations again included some of those unexpected gifts without which distribution could not be maintained. For the second year in succession the British Charities Association had entrusted the Fund with the distribution of a large sum. Last year the proportion allocated by the Association to London was £15,000. This year their receipts were greater, owing mainly to a competition organised with the coöperation of the *Daily Mail*, and the amount granted to the King's Fund for the hospitals of London was £20,000.

If, however, the income had increased, the demands on the funds were also growing. There were 15 more hospitals on the list, including 11 brought in by the enlargement of the area, and the expenditure of the hospitals was being continually increased by the discoveries of medical science, and by the provision of additional beds. That people sometimes forget. His Royal Highness hoped that no one would think, because the hospitals had, by a great effort, improved their position, that this was any reason for ceasing to subscribe. For every new extension that was opened, and every new discovery in hospital treatment meant a fresh call for expenditure. Taking extensions alone, the King's Fund, by devoting the Wells legacies largely to this purpose, had been helping to provide 697 additional beds, which would all have to be maintained. The Management Committee went into the whole question of extensions last year at the request of the Voluntary Hospitals Commission. Their conclusion roughly was that, whatever might be the total number of beds required, the immediate need was to expedite the schemes for the provision of the next 2000 beds, after which it would be time enough to face the more distant future. The Commission, in their recent report, accepted this estimate for London, and added another 8000 for the rest of England and Wales. The Distribution Committee had kept in mind the provision of more accident beds. Another 40 would be added with the aid of this year's grants, making, with 53 last year and 20 provided without assistance from the Fund, a total of 113 since the report of the Fund's Ambulance Cases Committee was published. His Royal Highness, in his conclusion, referred to the memorandum on pensions for hospital officers and nurses (vide THE LANCET, Dec. 19th, page 1299), in the preparation of which the Fund had taken part, and to the revision of the revised uniform system of hospital accounts, which the Hospital Economy Committee had now nearly finished. Referring to the year 1926, His Royal Highness said that he had appointed Lord Donoughmore as a successor to Lord Stuart of Wortley, who had found the detailed work of management more than he could continue to undertake. He had also appointed Mr. J. H. Thomas, M.P., a member of the Council in the place of Mr. Frederick Hall, M.P., and had added the names of Dr. Louisa Garrett Anderson and Mr. F. W. J. Jackson, while Dr. Morley Fletcher would become an additional medical member of the Distribution Committee.

The meeting closed with the usual votes of thanks.

WESTMINSTER HOSPITAL.—Mr. Austin Taylor, formerly M.P. for East Toxteth, has been appointed chairman of Westminster Hospital, in succession to the late Sir Edward Pearson. Mr. Taylor has for many years been a member of the House Committee of the Hospital.

PROVISION FOR CRIPPLED CHILDREN.—A movement is on foot to provide a hospital and other treatment for crippled children in Devon and Cornwall, and a site near Exeter has been given anonymously. It is stated that between 500 and 600 children in the area are awaiting treatment.

PROCEEDINGS OF THE ROYAL COMMISSION ON NATIONAL HEALTH INSURANCE.

(*Continued from p. 1248.*)

Evidence as to the Question of Proof of Unemployment.
(App. CII. and Q. 23290–23395.)

Mr. J. F. G. Price, a principal Assistant Secretary of the Ministry of Labour, gave evidence with regard to a suggestion which had been made that insured contributors under the Health Insurance scheme who are "genuinely unemployed" should be enabled to have their Health Insurance contribution cards impressed with a stamp at an employment exchange with a view to being relieved of penalties which would otherwise arise under the Health Insurance scheme because of failure to stamp.

Mr. Price's evidence was to the effect that, while it would be practicable to endorse with a rubber stamp the Health Insurance cards of unemployed workmen, it would dislocate the work of the exchanges and that his Department would prefer to give certificates of unemployment on application when loss of sickness benefit was directly at stake. There would be difficulties in any event with regard to agricultural workers and domestic servants, as these classes were not covered by the Unemployment Insurance scheme.

The examination of this witness was directed in the main to establishing that the automatic record at the time of unemployment would be easier in the long run, but the witness was not prepared to assent to this.

Sir Walter Kinnear's further Evidence.
(Q. 23396–23829.)

The Controller of National Health Insurance, Sir Walter Kinnear, was examined with regard to suggestions which had been put to the Commission on various questions other than those relating to medical benefit. The substance of his replies is given in the following paragraphs. The suggested exclusion of bank clerks and insurance officials who may cease to be insured on passing the income limit at an early age would involve difficult questions of demarcation, and there was no reason to think that the workers themselves desired to be excluded. A better way would be for their societies to provide out of their surpluses for treatment benefits for a limited period after the income limit had been passed.

Many persons belonging to the wage-earning classes as ordinarily understood, but not under contract of service, might well be brought within the Act.

We might provide for compulsory insurance in the case of employment under a contract for the performance of manual labour for the purposes of a trade or business, and that the person for whose business the work is performed should be deemed to be the employer.

The demand for voluntary insurance has been intensified by the passing of the Pensions Act.

The proposal to drop the manual labour test and determine insurability simply by rate of remuneration—possibly increasing the limit to £300 per annum—was open to objection on many grounds. Manual workers, earning high wages, are not in as stable an economic position as non-manual workers, and cannot be expected themselves to make the same provision for insurance.

A high rate of remuneration does not necessarily mean continuous employment, and . . . you might find that the docker, who was earning a high rate of remuneration for two or three days in the week, would be cut out of insurance, although his total income may not be very much larger than £250 a year.

With regard to the present age limits of 16 and 70, any reduction of the commencing age limit would be a retrograde step, and there is no widespread demand for it; the limit at the other end becomes 65 with the operation of the new Pensions Act. Insurance will cease at 65, and if a man is insured until then he will be entitled to medical benefit for the rest of his life.

A period during which a person is genuinely out of work and may be receiving unemployment benefit should not be counted against him for the purpose of his qualification for Health Insurance benefits.

It is indefensible that where under one State scheme a man is getting unemployment benefit because of genuine unemployment, concurrently with the receipt of that benefit he should be piling up arrears with the possibility of reduced sickness benefit under another State scheme.

Many witnesses, particularly those representing Friendly Societies, had suggested that a limit should be placed on the extent to which the standard rates of benefit should be allowed to be increased by way of additional benefit. The Department did not think it desirable to place a statutory limit; the Minister's present powers for approving schemes of additional benefits were considered adequate to meet the case.

The Department considers that it would not be practicable or desirable to merge the Workmen's Compensation scheme in the Health Insurance scheme. Such a system could not be worked in conjunction with a general scheme of insurance based on flat contributions. In any case, the Department considers that it would not be practicable for Approved Societies organised on their present lines to administer workmen's compensation insurance.

The provisions with regard to late notice of incapacity might be made less stringent—e.g., in cases where a member had gone into hospital.

With regard to the control of Approved Societies, further powers were necessary for dealing with minor irregularities, withdrawal of approval being much too drastic a remedy in such cases. Where on investigation general laxity was found a reduction might be made in the amount which a Society should be allowed to expend on administration. The Department has no evidence which suggests that the administration of benefits through Approved Societies is not acceptable to the insured population generally. Indeed, the administration of cash benefits by societies works, on the whole, quite well, and from the audit reports it is to be gathered that the standard of their administration has now reached a high average. The administration of schemes of treatment benefits is still largely in the experimental stage. The marked increase in the amount of money devoted to treatment benefits is accentuating the necessity for the administration of these benefits being coördinated through one local committee in each area.

As to the democratic control of large centralised societies, some improvement might be effected by ensuring notification to members of the general meeting and by facilitating the holding of district meetings, but the extraordinary apathy of the insured persons themselves must be recognised.

The original intention of Section 21 of the 1911 Act was to enable Approved Societies and branches without any question of receiving an equivalent return, to make subscriptions or donations to hospitals or charitable institutions which serve the interests of public health.

The section is now used by a number of societies for the purpose of providing benefits in the nature of additional benefits to all members, whether qualified to receive additional benefits or not, by paying quite considerable sums in anticipation of surpluses to organisations specially set up to receive such payments. . . .

We think the legislature really intended by "charitable institutions" to refer to hospitals and dispensaries and other institutions which provide on a voluntary basis benefits for the population as a whole, and not organisations purely set up for National Health Insurance.

The number of deposit contributors is steadily diminishing and the Deposit Contributors Fund has gradually become a clearing house for the societies except as regards the comparatively small number of persons who either in principle object to joining societies, or are unable to obtain admission to a society by reason of ill-health. Special provision might be made on lines, suggested by the witness,

for giving a more effective insurance to those who had tried to get into a society and had failed, but the Department did not recommend the establishment of a State Society.

It is not considered possible to extend to insured women who cease employment on marriage the ordinary provisions as to a free year's insurance.

BERLIN.

(FROM OUR OWN CORRESPONDENT.)

Responsibility of Medical Men in Germany.

A MEDICAL man in a country town was recently consulted by a mother because her 5-year-old child had broken its humerus near the elbow. He applied a starch dressing with a splint and told the woman to come back in a week unless the child had pain, in which case she should bring it at once. Although the child complained, was sleepless and feverish, the mother did not bring it up for a week, when it was ascertained that gangrene had set in, and eventually amputation had to be performed. The doctor was prosecuted. In court a local expert, giving evidence for the prosecution, said that the medical man should have examined the dressing on the first or second day instead of telling the mother to come in a week; he would then have ascertained that owing to the swelling of the arm the dressing had become too tight and had caused strangulation. Surgeons of great renown, such as Prof. Sauerbruch, of Munich, however, gave evidence for the defendant, saying that the gangrene was probably caused either by thrombosis or by a compression of the brachial artery by the fracture rather than by the dressing. Prof. Sauerbruch stated that in the out-patient department of his hospital the patients in similar cases were always directed to come in a week and to present themselves at an earlier date only if pain was felt. In his opinion the fault lay with the mother and not with the medical attendant. Notwithstanding this evidence the defendant was found guilty of bodily injury by neglect and fined 600 marks; moreover, an action for damages was brought against him by the mother. This verdict is the more remarkable in that the mother, living rather far from the medical man's residence, and notwithstanding the advice of her neighbours, had declined to come earlier on grounds of economy. The Director of Public Prosecutions, Ober-Reichsanwalt Dr. Ebermayer, discusses the legal position in the case in the *Deutsche Medicinische Wochenschrift*. He says that the term "malpraxis"—Kunstfehler—which is so often used in medical and lay circles is not contained in any of the German laws. Malpraxis may be described as an offence against the generally recognised rules of medical science either by insufficient knowledge or insufficient care. A medical man may be prosecuted for that misdemeanour by the Public Prosecutor and is, moreover, liable to pay civil damages to the injured patient. This is, however, only the case when, according to general experience, he could have foreseen that damage might result from his treatment. The damages he has to pay include the prejudice done by his action to the working strength and to the career of the patient. He is held responsible not only for his own mistakes, but also for those of his assistants. Hospitals may be held responsible for the action of their appointed staffs. A medical man may insure himself against the financial consequences of his mistakes. He may also be prosecuted when he has operated on a patient against his will, even when the operation has been performed lege artis and has been successful.

Medical Service in Prisons.

The defects of the prison medical service in this country have recently aroused attention. A former Minister had been arrested for alleged fraud committed whilst in office, and although cardiac debility had been certified by his private medical attendant, he was kept in prison until his death. Apart from the political side of the matter, it was stated in the course of a Parliamentary inquiry that some time ago the Minister of Justice had instructed the medical officers to give a certificate of unfitness for imprisonment only if there was no danger that the prisoner might escape, and not merely for reasons of health. They were further warned against attaching too much importance to private medical certificates, but it was left to their absolute discretion to advise the judge concerning a release on bail of the prisoner. The Parliamentary Committee further stated that the whole medical service in prisons was very unsatisfactory. There existed no whole-time medical officers for prisons; in the greater cities the law court medical officers and in the country the district medical officers of health had to attend prisoners besides their other numerous duties. In the case quoted above it was ascertained that the medical officer lived at a great distance from the prison and that when informed of the bad condition of the patient he gave his prescriptions by telephone. Before the Parliamentary Committee he gave evidence that the hospital connected with the prison contained 200 beds for which four nurses were appointed. He had on several occasions asked the authorities to appoint a resident medical assistant, since he was quite unable, owing to his other work as an expert in lawsuits, to give the patients the necessary attention; his demand had always been refused. Further evidence proved that as a consequence of the inadequate nursing staff the nurses, to keep the patients quiet, gave them indiscriminately quantities of narcotics, which in the case quoted above led to a fatal issue. The result of the inquiry was that the instructions of the Minister to the medical officers were withdrawn and that the number of the medical as well as of the nursing staff was increased.

Mortality of Insured Medical Men.

Dr. Freudenberg has published an interesting statistical record on the mortality of medical men insured in the Medical Life Insurance Company connected with the Hartmann-Bund. The period covered is from 1919 to 1923 and is compared with a similar record of the Gotha Life Insurance Company for the years of 1829 to 1885. The number of medical men involved is 3940 with 217 deaths. Infectious diseases, especially enteric fever, showed a great diminution compared with the Gotha record, owing to the general improvement of hygiene and the successful fight against infectious diseases. Diseases of the central nervous system have also diminished owing to the more efficient treatment of syphilis, and so have pneumonia and pleurisy. The percentage of malignant growths has undergone no change. It is interesting that the percentage of diseases of the heart and the circulatory organs in medical men has exceeded that of the general population, whilst formerly, according to the Gotha record, the contrary was the case. This is ascribed by the author to the circumstance that during and after the war the scarceness of spirits has produced a decrease in the mortality from cardiac diseases in the general population; on the other hand, in the medical profession deaths from those diseases are due not to an abuse of spirits, but to over-exertion connected with medical practice, which now involves a more strenuous life than it did. The distressed condition of the medical profession is, moreover, illustrated by the fact that of the 217 deaths recorded 16 were due to suicides committed between the ages of 46 and 61 years. Formerly suicides at that age were very rare; the average medical man was, as a rule, then able to retire from practice or at least to limit its scope and to enjoy the rest earned by his former work. Now the great mass of medical men must work until their death, and if unable to do so are likely to end as paupers or suicides.

Opilaçao or the Chagas Disease.

The head of the Brazilian Health Office and of the Hygienic Institute in Rio de Janeiro, Prof. Chagas, who is making a tour of Europe,[1]

[1] See THE LANCET, Nov. 7th, p. 988.

recently visited Berlin and read before the Berlin Medical Society a paper on the disease called after him, which is a form of trypanosomiasis common in Brazil. Prof. Chagas's paper was translated by his countryman, Dr. Rocho de Lima, of the Hamburg Institute for Tropical Diseases. He explained that the parasite which gives rise to the disease was detected before its clinical features were recognised. Its habitat is the intestines of a bed-bug which is found in native huts. In the night the bug bites men and animals, and in this way the disease is conveyed. The acute form of the disease occurs more particularly in children. Fever is always present, and a characteristic symptom is a swelling of the face. When the parasites in the blood are very numerous the patients nearly always die. If the disease enters a chronic stage the parasites are found not in the blood, but in the heart and in the central nervous system. Prof. Chagas is of opinion that a connexion exists between trypanosomiasis and goitre, which is endemic in Brazil.

PARIS.

(FROM OUR OWN CORRESPONDENT.)

Vital Statistics for the Third Quarter of 1924.

PROVISIONAL figures for the 90 French départements are compared for the third quarters of 1924 and 1925 by the Minister of Labour as follows:

	1924.		1925.
Marriages	36,095	....	35,014
Divorces	5,061	....	4,999
Living births	188,114	....	190,192
Stillbirths	7,437	....	7,367
Deaths under 1 year	15,493	....	17,007
Deaths, 1 year and over ..	124,228	....	134,275
Total deaths	139,271	....	151,282
Excess of births over deaths .	48,393	....	38,910

Vaccination in France in 1924.

In a well-documented report, Dr. L. Camus, director of vaccination at the Academy of Medicine, sets out the story of vaccination and revaccination in France during 1924. Reports from the departments show that obligatory vaccination has been accepted without hesitation except in a few places. Among those who presented themselves voluntarily for revaccination a percentage of 65 of positive results was noted, showing that vaccinal immunity is transient and that it is prudent to renew it from time to time. The percentage of success at primary vaccination was practically 100 per cent. Foreigners have been vaccinated in great number on their entrance into France. At Modane the number was 39,643; at Hendaye, 19,773; but the organisation has not been so complete at the other frontier stations. Forty-seven cases of small-pox were recorded in 1924. There were two small epidemics, one at Limoges and the other at Carcassonne, due to the sorting of rags. Six deaths were recorded: one at Marseilles, of a seaman who died five days after debarkation, four at Limoges, and one at Carcassonne.

Idiopathic Rise of Temperature.

Dr. Remlinger, director of the Pasteur Institute at Tangier, in a communication to the Academy of Medicine, has described persistent febrile attacks of which searching clinical and biological examination failed to determine the cause. He regards them as idiopathic, arising in subjects of thermal instability as a result of upset of heat regulation. He queries whether climatic factors are not concerned in their production, for in several of the cases, the febrile attacks ceased in France to reappear on returning to Tangier, a town with severe marine climate, the action of which, far from being sedative like the purely marine climate, is particularly bracing. It would be interesting to find out if parallel records of unexplained rises of temperature have been made on the shores of the North Sea or of the English Channel, which have a similar bracing marine climate. It may be that the marine fever of old writers has been denied wrongfully by too fervent disciples of thalassotherapy.

Measles in Paris: The Course of an Epidemic.

Dr. René Martial's account of the evolution in time and space of an epidemic of measles in the environs of Paris is not devoid of interest. The epidemic spread from south to north of the city and was held in check on the west by the Seine and on the east by a line of railway. On the south it was limited by a large tract of waste land and on the north by the Marne. The epidemic progressed slowly, taking nine months to reach from south to north, a distance of only five kilometres. The total number of cases was between 700 and 800 with 12 deaths. A maximum of 159 cases notified during April fell to 23 during June, the school holidays contributing to the disappearance of the epidemic.

A celebration is being organised for the seventy-fifth birthday of Charles Richet, professor of physiology at the Faculté de Médecine, which will also mark the completion of his fiftieth year as teacher and laboratory worker. Subscriptions may be sent to Mr. Pettit, treasurer of the committee of arrangements, 70, rue Jullien, Vanves, Seine.

Dr. Verger and Dr. Mauriac have reported four cases in which oral vaccination against typhoid, adopted preventively, was followed by typhoid. The periods elapsing between the final vaccination and appearance of the typhoid were 24 days, a few hours, eight days, and eight days.

The chairs of bacteriology and of experimental and comparative pathology at the Paris Faculté de Médecine are vacant. New appointments will soon be made.

The Conduct of Medical Practice.

XXV.—COVERING.

OF the duties imposed upon the General Medical Council by the Medical Acts, the disciplinary procedures against members of the profession convicted of unprofessional behaviour are the most difficult of comprehension by the public. And this is regrettable because the actions taken are taken entirely in the public interest. The offences, whose punishment is most frequently commented upon, may be grouped under improper advertisement and improper association with unqualified practitioners, and here the measure of impropriety must be estimated by the Council in accordance with its public duties, but for professional reasons, the force of which will not appeal always to the layman; and, if a particular case attract the attention of the lay press, it is sadly true that a large number of newspapers take the invariable line of assuming that hardship has been done, while ill-informed persons, often with much ability, take a pleasure in describing the Council as tyrannous. Further, as medical men themselves read daily papers, and meet the promoters of the agitations, the reiterated criticisms of the Council may have their effect upon them, if they are not conversant with the actual facts. When this occurs immediately the criticisms of the Council become more bitter, because it appears that the professional standards employed to protect the public do not give satisfaction to professional men; in short, those who regard the maintenance of professional standards as inimical to the public welfare view with satisfaction what they regard as a division of the medical forces.

WHAT IS COVERING?

While far more sympathy is always manifested by the lay press for the medical man who is removed from the professional roll for advertisement, it occasionally happens that the circumstances where

a practitioner loses his professional status for association with unqualified healers attracts public attention. This has happened, for example, in the case of Dr. Axham, because the unqualified man with whom he entered into intimate relations has received a knighthood while Dr. Axham's punishment for having entered upon those relations has not been relaxed. If, however, the story is considered from the beginning, it will be seen, first, that the Council had little or no option when they removed Dr. Axham's name from the Register, and secondly, that the method of restoration does not depend primarily upon the Council. Under the Medical Act of 1858, the Council is enjoined, at its discretion, to delete from the official roll the names of medical men whose conduct in professional respect is derogatory to accepted standards. To ensure that medical men shall not err through ignorance, the Council issues warnings, and among these one has appeared pointing out that association by a qualified medical man in medical practice with an unqualified person would render the medical man subject to penalty. Dr. Axham was associated in practice with Sir Herbert Barker—then Mr. Barker—who treated patients without possessing statutory medical qualifications, and the association was not denied. The circumstances were brought before the General Medical Council by the Medical Defence Union, and the Council finding the offence proven—it was not denied—decided to remove Dr. Axham's name from the Register unless he terminated his arrangement with the unqualified man. Dr. Axham then preferred to maintain the existing position, but he is now anxious to re-obtain registration. Being of advanced age, there is no doubt that he is no longer committing the offence for which he had to answer; the position of the Council, however, is that only qualified persons can be entered on the Register. Now Dr. Axham has lost his qualifications, for his diplomas were taken away from him by the Royal Corporations which had previously granted them in response to examinations. Unless and until the diplomas are restored the Council has not the power to act in the way it is insisted upon in some quarters that it should. It can be understood readily enough that this point might not be clear to the laymen who have attempted to advance the cause of Dr. Axham by abuse of the General Medical Council, but it is a little surprising to find medical men equally ill-informed as to the Medical Acts and as to the constitutional position and duties of the General Medical Council. On the general need of action by the disciplinary body of the profession against covering there cannot be two opinions, for if a man who is not qualified can practise as a doctor through association with one who is qualified, the Register ceases to protect the public against irregular practice. Again, to the question of whether a particular unqualified person can have exceptions made in his favour there can be but one answer—any exception would frustrate the whole of disciplinary procedure.

Ancillary Medicine.

Medical men who are careful to help in the maintenance of professional standards, and who are rightly jealous of the privileges conferred upon them in return for a strenuous and lengthy training, have many of them recognised, and recently with increasing force, that there are certain quasi-medical services, ancillary to scientific medicine, which are rendered properly by those without medical qualifications. The public can take advantage of such services, if that is desired, in a way that is of the greatest use to them, if the services are given upon medical advice as the need arises. There is then no doubt that the public obtains the assistance in response to medical advice, persons who do not need the particular treatment are not mulcted of fees, cures for non-existent conditions are not bruited abroad, specifics for cancer are not made the medium of false hopes, and lastly real benefit is obtained through the rightful exercise of special attainments.

Correspondence.

"Audi alteram partem."

THE EXTRINSIC ORIGIN OF CANCER.

To the Editor of THE LANCET.

SIR,—I have been greatly interested in Prof. Blair Bell's noteworthy paper on the Specific Character of Malignant Neoplasia, published in your issue of Nov. 14th. I believe he has made a contribution to our knowledge of cancer that will prove of very great value.

At the Memorial Hospital in 1915, following the lead of Loeb of St. Louis, we made an extensive experimental study of the effects of colloidal copper upon various types of malignant disease. However, the effects were so slight that we abandoned the method after several months' trial. Evidently Prof. Bell has proved that the inhibitory action of colloidal lead is much more marked than that of colloidal copper. His striking success in a considerable number of cases is of the utmost interest and importance. If these successful results prove permanent, as seems to be true in a few cases at least, and the method can be carried out without too high a mortality, we shall have added to our present very limited means of controlling cancer the only systemic method of attacking malignant tumours—with the exception of the administration of the mixed toxins of erysipelas and *Bacillus prodigiosus*, the value of which is restricted chiefly to sarcoma.

The larger part of Prof. Bell's paper is devoted to a discussion of the nature of cancer which, he believes, is far more important than a study of the specific cause of the disease. To quote him: "It is the result rather than the cause, as I hope to show, that is important, for undoubtedly malignant neoplasia is a specific process, but that is not to say that because a process is specific the cause must also be." He believes that the results of his method of treatment with colloidal lead strongly support, if they do not actually prove, his theory of the cause of cancer—i.e., that "malignant neoplasia in the human subject is a biological atavism," or, in other words, that the disease is due to intrinsic causes.

I do not believe that the rapidly accumulating evidence in favour of the extrinsic origin of cancer that has been presented within the last year by Glover, of Toronto and New York, by Young, of Edinburgh, by Nuzum, of Chicago, and last and most important, perhaps, of all, by Gye and Barnard, of London, can be so easily ignored or cast aside. The clinical evidence in favour of the extrinsic origin of cancer is, I believe, even stronger than the laboratory evidence. This clinical evidence was outlined at the annual meeting of the American College of Surgeons in October, 1924, in a symposium devoted to a discussion of Nuzum's paper.

I believe that Prof. Bell's success with the colloidal-lead method instead of supporting his view that cancer is of intrinsic origin actually furnishes another and very strong link in the chain of evidence in favour of the extrinsic origin of cancer. Assuming malignant tumours to be of extrinsic origin, or due to some micro-organism or virus, it would be the most natural thing to expect such micro-organism or virus to be influenced by chemical changes in the body fluids or by some chemical substance introduced by intravenous injection. We could ask for no better analogy than the effect upon syphilitic tumours caused by the introduction of salvarsan.

I can find nothing in Prof. Bell's experiments or results to confirm the belief expressed by himself that "causes are as nothing in comparison with the importance of the realisation that malignant neoplasia is a specific process of the nature, and subject to the control I have described."

Whatever be the final solution of the great issue, whether the theory of the extrinsic or intrinsic origin

of cancer be the correct one, we should do nothing to discourage further research upon the problem; for the greatest hope of ever controlling the disease or of lowering its steadily increasing mortality rests upon the discovery of a specific cause.

I am, Sir, yours faithfully,

New York, Dec. 5th, 1925. WILLIAM B. COLEY.

PROFESSIONAL CRITICISM OF THE GENERAL MEDICAL COUNCIL.

To the Editor of THE LANCET.

SIR,—The very interesting leading article in your last issue deals adequately enough with public misapprehensions as to the constitution and functions of the General Medical Council, but, I would venture to suggest, fails to appreciate the whole of the professional case against this tribunal. Possibly you had intended to deal with these on another occasion, but in any case I should be glad if you would permit me a few remarks on the subject.

"It is not enough," you say, "that justice should be done; it is essential that it should seem to be done." It is very difficult from the information supplied by the medical press to form any definite view as to whether justice has or has not been done. In the first place there is a complete absence of that valuable précis—the judge's summing up. The charge is stated to be proved—i.e., the defendant is found guilty of infamous conduct in a professional respect. But no information is available as to exactly which of the alleged actions can be regarded as satisfactorily established. For example, was Dr. Lloyd at fault in permitting publication of his views (if he did so) or in accepting patients directed to him in this manner (if he did so, for none but the members of the G.M.C. know what facts were considered proved) or did the conjunction of the two create the offence? Secondly, we are never told what the penalty is intended to be—erasure of a name for a few months, or years, or for ever. Many members of the profession will be surprised to find restored to the Register the name of a gentleman who seems to have deliberately courted expulsion and who has not, so far as any one of your general readers can be aware, modified his attitude or purged his offence.

Those acquainted with the actual procedure of trials know that the mere physical circumstances and general atmosphere impose a definite hardship. I have commented elsewhere on the jury's letter-writing habits and would add that, if the jury must remain at 40 or thereabouts, it would be the barest justice to so arrange them that the defendant and his counsel might have them all properly in view. Nor is it desirable that counsel should be obliged to pause from time to time in his remarks until he may have the attention of the court—as certainly happens now.

It is sometimes said and thought that the G.M.C. is both accuser and judge. There is not lacking some ground for this misapprehension. His Majesty's judges administer a law made by others, the G.M.C. administers a law made by itself—the law of warning notices. This law is of a very general character and it is difficult for a defendant to argue that he has not infringed a law of whose detailed implications he cannot well be aware. Indeed, it may well happen that he will not learn the law applicable to his case until he has already been convicted, and he cannot altogether be blamed if he feels that the law may have been made to fit his case—especially if that case be some exposition of the modern art of advertising not hitherto brought to the notice of the G.M.C. And anything approaching an atmosphere of informality will certainly much increase any feeling of grievance which he may experience.

Then, again, it is known to those who have considered the matter that the G.M.C. may have great difficulty in ensuring that proper cases be brought before it. The Registrar receives from members of the profession press cuttings and other information. He cannot bring cases before the G.M.C. unless someone will prosecute. Potential prosecutors are few and willing prosecutors fewer still. Yet the facts brought to his notice and perhaps to his alone may clearly call for action. What is he to do? What in fact does he do? I will not answer this question, but I think it will be seen that prosecutor and judge may be forced into a juxtaposition very disagreeable to both of them.

This difficulty of a prosecutor sometimes seems to lead to a rather curious selection of cases. For example, where a doctor has appeared as co-respondent in a divorce case, it is often possible for a husband so inclined to secure his appearance before the G.M.C. On the other hand, if the husband does not know what is possible or is disinclined for action, the erring doctor may continue in practice and on the Register. The crime may be the same, but whether just retribution shall follow depends on chance and not on the G.M.C. This, I suggest, inevitably detracts from the dignity and status of that tribunal.

Finally, I would draw attention to the very small representation on the jury of those who can be considered peers of the accused. Those who experience in their daily lives the many difficulties and complexities of general practice are in a small minority. Yet, if professional standards of what is infamous are to adapt themselves to changing times, it is these very persons who are best able to judge of what adaptations are properly admissible. The majority of the G.M.C. cannot so easily judge from the standpoint of a life which they have never shared. A certain loss of touch with realities seems to be shown by the warning notice and other pronouncements about certificates. National Health Insurance is so administered that perhaps the majority of practitioners give with considerable frequency certificates which, although false, seem to be necessary if patients are to receive the benefits due. There is also a frequent certificate which requires the doctor to certify that he has seen all the children of so-and-so alive on this date. It may be that one of the children is not at home; it is seldom that the children are produced for inspection. Every circumstance in both cases conspires to prompt the doctor to an action which, in 99·9 per cent. of cases, is no more fraudulent or unethical than the subscription of "Yours sincerely" to an entire stranger. The G.M.C. does not seem to be aware of this particular source of trouble in medical practice. It is very prevalent and seems to increase. One would wish to see some sign that the distinction between technical inaccuracy and fraud or carelessness was better appreciated.

I must apologise for the length of this letter, but the matter is one of great importance to the profession. It is very necessary that the profession should feel confident in the G.M.C. I am less concerned about the public at the moment, the case for the public would follow different lines. It will be seen that there is a good deal which might be remedied without any alteration of the law. I do not impute any blame to the individuals who compose the G.M.C. except in so far as they have permitted a regrettable informality where a man's livelihood is at stake. But I and many others will be justified in imputing blame if we feel that no attempt is made to meet honest criticisms, and it is to avoid that unwanted justification that I have written at some length.

I am, Sir, yours faithfully,

Sevenoaks, Kent, Dec. 18th, 1925. GORDON WARD.

AN APPEAL FOR HUMAN EMBRYOS.

To the Editor of THE LANCET.

SIR,—We are in process of forming here a collection of serial sections of human embryos which will be available for study by all competent investigators. No reference collection such as we contemplate exists anywhere in England. It can only be got together through the active coöperation of medical men in practice, and we accordingly appeal to them for aid in the collection of the material. Year by year

hundreds of specimens are wasted simply because the medical men into whose hands they fall do not realise that there is any demand for them, or that they are of value for embryological purposes. Our knowledge of human development and of the processes and conditions that result in abnormal development is still very incomplete, and it is only by the study of properly preserved specimens that the blanks in our knowledge can be filled up. Abundant human material of the kind we want is really available, and all that we ask is that such specimens as may from time to time come into the hands of practitioners should be preserved and sent to us, together with such clinical data as may be available.

We wish particularly: (1) *Embryos* passed in abortion, together with the membranes and decidua; where no embryo is apparent, the decidual fragments should be carefully preserved. (2) *Tubal pregnancies*, if possible unopened. (3) *Pregnancies in utero*, where the entire uterus is removed for surgical reasons; in such cases, the uterus should be opened by a median incision along the anterior wall and should then be placed in a large vessel filled with 10 per cent. formalin. (4) Under favourable conditions, the *uterus* and *ovaries* from P.M. subjects. (5) *Curettings* from cases where one or more periods have been missed. (6) *Stillborns*, particularly abnormal subjects.

Preservation of Specimens.—The most convenient preserving fluid is 10 per cent. formalin (ordinary formalin, 1 part, water or preferably normal saline, 9 parts). It is essential that specimens should be put into *plenty* of the formalin solution *as soon as possible* after they are obtained and that the solution should be changed for fresh after 24 hours. When forwarding the specimen, the bottle should be completely filled with the fluid; this prevents damage to the specimen through shaking.

We are prepared to send suitable bottles filled with preserving fluid, in containers for posting, on receipt of a post-card, or when the specimen is large, to arrange for its collection in the London area. The clinical data relating to the specimen are of great value and should be sent with it. We will send the practitioner a short report immediately on receipt of the specimen, and later on a more detailed report should it be desired. It is only by enlisting the help of practitioners in preserving such specimens as turn up in practice that we can hope to build up a really representative collection of human embryological material.

Specimens should be sent to the undersigned, Department of Embryology, Institute of Anatomy, University College, Gower-street, London, W.C. 1.

I am, Sir, yours faithfully,

JAS. P. HILL,
Professor of Embryology.

Dec. 17th, 1925.

MASSAGE OF THE MIDDLE EAR.

To the Editor of THE LANCET.

SIR,—In reference to your annotation upon Massage in the Treatment of Middle-Ear Deafness, it may interest your readers to know that I have, during the past 30 years, made use of this treatment in many forms, from the primitive Siegle speculum and its off-shoot the Delstanche otomasseur to various kinds of instruments worked by hand, water-power, or electric motor. As you very wisely point out, their effect is mostly upon the more mobile parts of the membrane and ossicles, and they have little, if any, influence upon adhesions or upon ankylosis of the ossicles of long standing. Some years ago I tried pneumatic otomassage in selected cases after mobilisation of the malleus, or following such operations as exploratory tympanotomy with severance of adhesions. The results were disappointing. In no case have I ever found the pneumomasseur in any form to have other than transient effects, and I am of opinion that when this temporary improvement occurred it was due to the equally transient hyperæmia induced.

Judging by a recent symposium in the United States, however, it would appear that most otologists are agreed that vibratory massage of some sort offers the best chance in the treatment of chronic middle-ear deafness. The whole question lies in the nature of the massage to be employed. With the instruments referred to the movements are too coarse to be of any real value; what is required is a movement of extremely short wave-length. The only instrument that I know which furnishes such a movement is the electrophonoïde of Dr. Zünd-Burguet. This method of treatment, so unfairly criticised by British otologists until G. C. Cathcart's paper appeared in your columns,[1] is giving excellent results in my hands. It is a method of auditory massage which is eminently adapted to the ear because it is performed by sound waves, which are obviously the proper physiological stimulant for the hearing organ. As Dr. Zünd-Burguet points out in his "Principes d'Anacousie," the method is both pedagogic and therapeutic. On the one hand, it teaches the patient to listen and to hear; on the other, by its local action in causing hyperæmia, it stimulates the tympanic mucosa and intratympanic muscles, and causes a regeneration of tissues, analogous to the action of massage upon a wasted, stiffened limb, whereby the ossicular joints are freed and adhesions stretched. In one case recently a young lady, whose hearing was reduced to R. = 6 in. and L. = 0 for the whisper and R. = 4 ft. and L. = 1 ft. for the ordinary voice, and whose case was pronounced to be hopeless by two well-known provincial otologists, improved after 12 sittings to R. = 4 ft., L. = 1 ft. for the whisper and over 20 ft. R. and L. for the low voice. After the full 30 sittings her paracusis Willisii disappeared, and she could hear everything in a theatre from the middle of the stalls.

I have no experience of Dr. Braun's new method mentioned in your annotation, but I would venture to suggest that the Zünd-Burguet method is superior and far less uncomfortable than massage of the naso-pharynx and Eustachian tubes by wool-tipped probes.

I am, Sir, yours faithfully,

MACLEOD YEARSLEY.

Wimpole-street, W., Dec. 19th, 1925.

The Services.

ROYAL ARMY MEDICAL CORPS.

MILITIA.

Maj. (Bt. Lt.-Col.) W. H. G. H. Best retires on attaining the age limit, and retains his present rank.

TERRITORIAL ARMY.

General List.—Lt.-Col. (Bt.-Col.) F. Hawthorn, having attained the age limit, is retired, and retains his rank with permission to wear the prescribed uniform.

Lt.-Col. J. Barkley and Majs. L. A. Mackenzie, A. Coleridge, W. S. Richardson, and L. J. E. McHugh, having attained the age limit, relinquish their commns. and retain their rank.

General Hospitals.—Maj. C. A. S. Ridout, having attained the age limit, relinquishes his commn. and retains his rank.

Supernumerary for Service with the O.T.C.—Maj. W. J. A. Laird (Res. of Off.) to be Maj. and to command the Med. Unit, Belfast University Contingent Senr. Div. O.T.C.

TERRITORIAL FORCE.

General List.—Maj. (Prov.) H. Forrest is confirmed in his rank.

ROYAL AIR FORCE.

E. A. Aslett and H. M. Levy are granted short service commissions as Flying Officers, for three years on the active list.

[1] THE LANCET, 1925, i., 968.

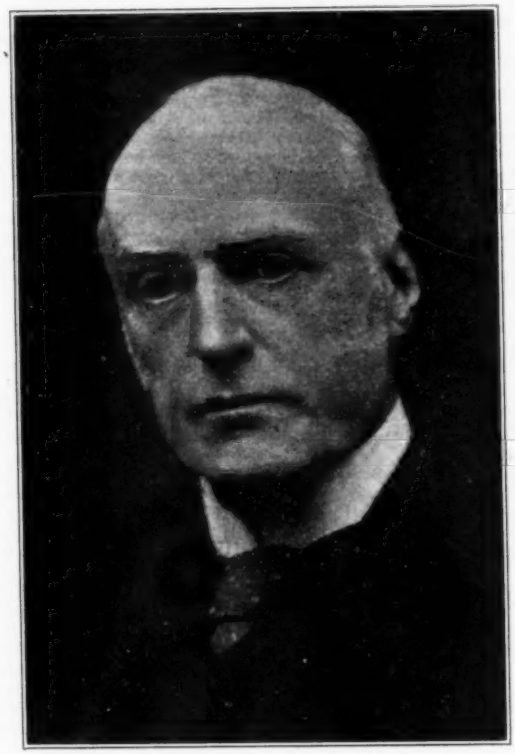
KINGSTON-ON-THAMES HOSPITAL.—The board of guardians have decided to proceed with a scheme for the extension of Kingston and District Hospital and the erection of a nurses' home, at an estimated cost of £100,000.

Obituary.

SIR RICHARD DOUGLAS POWELL, BT., M.D., F.R.C.P. LOND., K.C.V.O.,

PHYSICIAN-IN-ORDINARY TO H.M. THE KING; CONSULTING PHYSICIAN TO THE MIDDLESEX AND BROMPTON HOSPITALS.

WE announced last week the death after a short illness of Sir Richard Douglas Powell, which occurred on Dec. 15th at his residence in London in the eighty-fourth year of his age. He had for many years been an outstanding and deeply respected leader of the medical profession. His broad outlook on medicine in general, his attainments in special clinical fields, and his sincere regard for the best



SIR RICHARD DOUGLAS POWELL.

ideals before the profession which he adorned, had made of him in the medical world, as in the world without, a veritable type of the wise consulting physician.

Richard Douglas Powell was born at Walthamstow in 1842, being the second but only surviving son of Captain Scott Powell, an officer in the Royal Welsh Fusiliers. Educated privately, he received his medical training at University College, London, and graduated in the University of London just 60 years ago as M.B., proceeding to the M.D., which he took with honours in the following year. Quite shortly afterwards he was appointed assistant physician to the Brompton Hospital for Consumption and Diseases of the Chest, and as active member of the staff and consulting physician he served the hospital for 57 years.

His first position on the staff of a London general hospital was at Charing Cross, where he was elected assistant physician and lecturer on materia medica in 1871, a post which he occupied until appointed in 1878 assistant physician at Middlesex Hospital. Here he became full physician three years later, and during 30 years was a mainstay of the scientific, educational, and charitable activities of the institution.

In three different directions throughout his long professional life Douglas Powell occupied a prominent position to the satisfaction of all who worked with or under him. He was a great Court physician; he was a great President of the Royal College of Physicians of London, and he was a great clinician. His introduction to the Court was due to the high opinion which Sir William Jenner had formed of him in the early stages of his career when he was filling the junior posts at University College Hospital. The connexion between his distinguished master and Powell was an intimate one, and led to his appointment as physician-in-ordinary to Queen Victoria at a comparatively early stage in his professional career. He became at once an acceptable figure at Court, where no doubt his distinguished and graceful personality were appreciated in common with his wide range of ability. He attended Queen Victoria in her last illness, and subsequently was physician-in-ordinary successively to King Edward VII. and to the present King.

His connexion with the Royal College of Physicians of London began with the Membership, which he took in 1867. He was elected Fellow in 1873, served as Senior Censor in 1902, and as President for five years—namely, 1905 to 1910. He is on all accounts allowed to have been a successful President, maintaining the dignity of the office, and sparing no pains to insure that the College should take an intimate part in professional progress.

As a physician he was a leading figure not only in London, but in all medical society at home and abroad for more than half a century. His early association with Brompton Hospital dictated the fact that it was as a specialist in pulmonary and cardiac conditions that he became most widely known, but throughout the greater part of his professional life his work at the Middlesex Hospital enabled him to maintain legitimately the position of an all-round man, and to look upon the large and particular branches in which he may be said to have specialised as a chapter, if a very large and far-reaching one, in the general story of pathology. It goes without saying, therefore, that he spared no pains to keep abreast of medical technique and medical literature. His work upon the physics of the chest, which appeared as long ago as 1875 in the Transactions of the Medical and Chirurgical Society, showed both the general and special knowledge which he had already acquired.

Thus Douglas Powell, both in personality and in achievement, looms large in the medical history of his generation, and there will be none to cavil at the high measure of success he secured. At a time when specialism was less the rule than at present, he was at once an accomplished general physician and a specialist of world-wide renown. His long association with the Brompton Hospital probably served to determine his special bent towards the study of diseases of the lungs and heart. His was an eminently practical turn of mind, and it is therefore not surprising that his interest was more especially directed to the clinical features of these diseases and particularly to their treatment. His well-known "Text-book of Diseases of the Lungs," was one of the earlier special monographs. That it has fulfilled a useful purpose is shown by the fact that it has reached a sixth edition, in the preparation of which Sir Percival H.-S. Hartley has collaborated. It is worthy of note that the careful clinical and pathological study of disease by the generation of physicians of which he was so distinguished a representative rendered possible the modern advances which have been achieved by instrumental and experimental methods and by the more scientific means of investigation now available.

A mere enumeration of the more important of his contributions to the study of diseases of the lungs and heart affords a striking testimony not only to his industry, but to his profound acumen in these matters.

His earliest communication to the Royal Medical and Chirurgical Society, on Some Effects of Lung Elasticity in Health and Disease, discussed the problems of the negative pressure in the pleural space and its effects in a way which indicate the new purview of diagnosis. He subsequently read papers or published notes on pulmonary tuberculosis, pleuritic effusion, pneumothorax, and hæmoptysis. He delivered the Lumleian lectures before the Royal College of Physicians on Principles which Govern Treatment in Diseases and Disorders of the Heart. These lectures were published in THE LANCET and are a model of what such disquisitions should be—they were clear, informatory, based on constructive work and not on routine.[1] In his Harvein Oration, delivered at the same College in 1914, he dealt with the principal Advances in Knowledge Regarding the Circulation and Attributes of the Blood since Harvey's Time. The oration was at once simple, eloquent, and learned; the résumé of modern knowledge as to the influence of the internal secretions and the defensive attitude of the blood, with which it closed, being a model of the attitude which a great healer should take towards progressive developments in his science and art. Other subjects which engaged his special attention and interest were angina pectoris, aneurysm of the aorta, and mediastinal tumour, on all of which he contributed articles to "Reynolds's System of Medicine"; in the last his summary of the pressure signs of aneurysm was singularly clear and practical. His style was cultured and polished, without being pedantic. His clinical lectures were always worth listening to. They often included descriptions of cases rather in the manner of Sir Thomas Watson or Trousseau, with admirable practical hints in regard to treatment. Since the war he delivered an emeritus lecture at the Middlesex Hospital on the Problems of Blood Pressure, which showed that he retained his keen interest in the problems of diseases, and that he was still keeping in touch with the modern advances.

His tenure of the post of the President of the Medical and Chirurgical Society was marked by the successful carrying out of the scheme for amalgamation of the metropolitan societies which had been ventilated 12 years previously by Sir John MacAlister, with Sir Andrew Clark behind the movement. The scheme received the approval of a large group of leaders of the medical profession within and without the metropolis, but the interests involved were not always identical, and there is no doubt that the universal respect in which Douglas Powell was held, and the tactful manner in which any negotiations which fell to his share were carried out, counted enormously in the institution of the Royal Society of Medicine.

We have received a tribute to him from one who had known him for over 30 years, and been in close association with much of his work. The letter runs: "Sir Richard Douglas Powell was a very reserved man, but to one who was privileged to work with him and for him for many years he revealed himself as one of the most kind-hearted and generous of men as well as the dignified and courteous personality that all could observe. His courtesy was of deed as well as of word, and was the expression of a beautiful and unselfish character, and not a veneer. His kind-heartedness was displayed in his readiness to help any who asked his advice, and he entered into their difficulties in such a way that his counsel became of value because so well directed. At the same time his consideration for those who assisted him was marked; indeed, he always seemed surprised and even grateful for the smallest service rendered to himself. His watchwords were self-constraint and self-control, and he acted up to his principles. Good-tempered, he kept his temper completely under control save where occasionally it flashed out in scorn of mean or self-interested actions, or of slackness, of which he was quite intolerant. For the rest his knowledge of human nature and its foibles was so wide that his sympathy was always extended to those who were doing their best, whatever the accomplishment; and though he could, and would, rebuke where he considered this was deserved, the rebuke would be so tempered as to stimulate rather than to humiliate. His strong character made it impossible to turn him from a course of action while he was convinced that it was the right one, an aspect of him which was better known to his intimate circle than without, where his graciousness of manner obscured to superficial observation his determination."

To him honours came in profusion. His Court appointments have been mentioned. He was an Hon. D.Sc. in the University of Oxford, an Hon. M.D. in the University of Dublin and the Royal University of Ireland, Aberdeen and Birmingham Universities gave him an LL.D., and he was an Hon. F.R.C.P. Irel. He was created a baronet in 1897 and appointed K.C.V.O. in 1901.

Sir Richard Douglas Powell married in 1873 the second daughter of the late Sir John Bennett, by whom he had three sons and two daughters. He is succeeded in the baronetcy by his eldest and only surviving son, Lt.-Col. Douglas Powell, C.B.E., the two other sons having given their lives for their country, the second son being killed in action in the South African War and the youngest one dying of wounds in Mesopotamia in 1916. The tragedies tried the father deeply, but his patriotic courage suppressed resolutely his deep sufferings. He married secondly in 1917, Edith Mary, daughter of the late Mr. Henry Wood, of Cleveland-square, who survives him, and to whom we tender every sympathy.

[1] THE LANCET, 1898, vol. i.

EDWARD FRANCIS PALGRAVE, M.R.C.S. ENG.

Dr. E. F. Palgrave, who died in London on Dec. 13th, was son of the late William Gifford Palgrave, of the Foreign Office Service, and was born at St. Thomas's Island in 1875. He was a nephew of Francis T. Palgrave, professor of poetry at Oxford, of Sir Reginald Palgrave, Clerk to the House of Commons, and of Sir Inglis Palgrave, the well-known economist. He was educated at Clifton where he gained an entrance exhibition, entered St. Bartholomew's in 1892, qualified in 1897, and was appointed by Sir William Church as his house physician. After passing through the Tropical School of Medicine, he practised at Sunbury, Middlesex, for six years, after which he obtained an appointment in the school medical service of Middlesex, where he remained for four years. In 1912 he was appointed to the school medical service of the London County Council, where his ability soon manifested itself; while pursuing his routine duties he made several reports which attracted attention, in particular dealing with the causes of malnutrition in school-children.

Dr. Palgrave joined the Royal Army Medical Corps in 1914 and was put in charge of the Officers' Hospital at Havre for 12 months when, owing to the absence of many senior officers, the need for some one with exceptional clinical knowledge was experienced at the headquarters of the London County Council, and he was withdrawn from the school medical service in order to work at the head office. New administrative duties allotted by statute to the Council necessitated an increase in senior officers, and in 1920 Dr. Palgrave was promoted to the office of divisional medical officer. In this capacity he directed the administration of the Midwives Act and the sections of the Children Act dealing with children below school age. He also took a large share in the new and responsible work connected with the public provision for the treatment of venereal diseases.

For the past 18 months his health had been visibly failing, nevertheless he made heroic efforts to carry on his duties. "Palgrave's geniality and unselfishness," writes one of his colleagues, "had endeared him to all who worked with him, while his clinical acumen and administrative ability had earned their deep admiration and respect."

Parliamentary Intelligence.

NOTES ON CURRENT TOPICS.

Bethlem Hospital Bill.

ON Wednesday, Dec. 16th, a motion was agreed to in the House of Commons carrying over to next session the Bethlem Hospital Bill. Mr. J. F. HOPE, Chairman of Committees, stated that the Bill had been objected to from time to time, and he had adjourned it in the hope that a settlement might be arrived at. No settlement had yet been reached, but he had every hope that if the measure was carried over to next session a settlement might be arrived at. On Friday, Dec. 18th, in the House of Lords a similar order was agreed to.

Asylum Officers' Superannuation.

Mr. TAYLOR presented a Bill in the House of Commons on Friday, Dec. 18th, to amend the Asylum Officers' Superannuation Act, 1909, which was read a first time.

HOUSE OF COMMONS.

WEDNESDAY, DEC. 16TH.

Vaccination Exemptions.

Mr. GROVES asked the Minister of Health whether, in view of the fact that the ratio of exemptions from vaccination was progressively increasing and the ratio of small-pox deaths correspondingly decreasing, he would consider legislation to amend the obligatory vaccination laws and put them in such a way that persons who themselves desired or desired their children to be vaccinated should apply for such publicly assisted service, not, as at present, that those who desired to be exempt must apply.—Mr. N. CHAMBERLAIN replied: I am not prepared at present to consider the question of legislation on the lines suggested by the hon. Member.

Deaths from Small-pox.

Mr. GROVES asked the Minister of Health if he would present statistics to show the number of persons in England and Wales who, in the ten years ending with 1921, died of small-pox although admittedly successfully vaccinated; the number of persons who died of small-pox in the same period and were classified as not vaccinated; the number classified as doubtful who died of small-pox; and the percentage of births vaccinated in that period of ten years.—Mr. N. CHAMBERLAIN replied: The records in the possession of my department show that, of the 122 persons who died of small-pox during the ten years ending with 1921, 43 had been vaccinated, 59 had not been vaccinated prior to exposure to infection, and in 20 instances the vaccinal condition was doubtful. The 43 vaccinated cases included no person under the age of 12, 4 persons between the ages of 12 and 25, and 4 between the ages of 25 and 35, the remainder being in each case over the age of 35. The records show that only 4 of the vaccinated cases had been revaccinated, the ages of these persons being 25, 35, 58, and 64 respectively. Of the 59 unvaccinated persons, 26 were under the age of 12, 18 between the ages of 12 and 25, 9 between the ages of 25 and 35, and 6 over the age of 35. The percentage of births vaccinated during the period in question was 43·5.

Sanatorium Treatment for Pensioners.

Mr. PIELOU asked the Minister of Pensions the amounts spent by his department upon sanatorium treatment for pensioners suffering from tuberculosis during the last five years.—Major TRYON replied: The aggregate expenditure of my department upon the treatment of pensioners in sanatoriums during the five years ending March 31st, 1925, was approximately £2,500,000.

Duties of D.C.M.S.

Mr. ROBINSON asked the Minister of Pensions what area deputy commissioners of medical services were responsible for more than one area as constituted under the War Pension Act of 1921, and in what town was the office of the area deputy commissioner of medical services situated; and what were the areas for which area deputy commissioner of medical services was responsible.—Major TRYON replied: Each of the deputy commissioners of medical services is responsible for more than one area with the exception of the deputy commissioners stationed at Aberdeen, Gloucester, Leicester, Belfast, and Bristol.

Final Pension Awards.

Mr. DAVID GRENFELL asked the Minister of Pensions whether, seeing that of 6239 appeals heard against final awards made by the Ministry 3381 were successful, he would take steps to ensure that more careful consideration of the men's disabilities was given by the medical final awards board and awarding officers, so that men were not under assessed and/or their pensions terminated without sufficient cause.—Major TRYON replied: I would remind the hon. Member that about half the cases in which the appeal is regarded as technically successful are cases where the Ministry's assessment was not modified, but finality of the award was for the time being set aside for further consideration. The existing instructions of the Ministry provide for the fullest consideration of all cases and a final award is not made where the prognosis of the case is doubtful or there is prospect of deterioration.

Pensioners and Chronic Chest Trouble.

Mr. RADFORD asked the Minister of Pensions the approximate number of ex-Service men in receipt of pension for chronic chest trouble; and would he consider the advisability of providing establishments for such cases in parts of the country with a salubrious climate where these men, particularly those from the industrial areas, might proceed for a period during the winter months when they suffered most severely from their home climatic conditions.—Major TRYON replied: About 59,000 men are in receipt of pension in respect of a disablement arising from one or other form of chest affection. Rather more than half the total number are cases of pulmonary tuberculosis, for whom treatment is by statute the concern of the local health authority acting under the Ministry of Health. As regards sanatorium provision for these cases, I understand that the climatic factor is always considered. Cases, however, of chest affection other than tuberculosis are, where necessary, provided for in Ministry institutions situated in various parts of the country, and in the event of a change of climate being essential in any individual case transfer from one hospital to another can be effected. The results of treatment of these cases in Ministry institutions do not, I am advised, indicate any need for the setting up of further institutions in other localities.

School-children and Dental Treatment.

Colonel DAY asked the President of the Board of Education whether his attention had been drawn to the fact that of 2,000,000 school-children inspected in 1924, 67 per cent. of whom were found to be in need of dental treatment, only 55 per cent. received such treatment; and what action was contemplated in order to deal with those not receiving dental care.—Lord E. PERCY replied: I assume that the hon. Member refers to the statement on p. 66 of the report of the Board's chief medical officer for the year 1924. As regards the second part of the question, this is one of the matters that local authorities have doubtless been considering in connexion with their programmes.

Ex-Service Men and Tuberculosis.

Mr. PIELOU asked the Minister of Health whether, in view of the fact that over 21,000 ex-Service men had died from tuberculosis as a result of their war service, he intended to adopt the recommendation of the Inter-departmental Committee of 1919 and expend the amount suggested for the purpose of increasing village settlements throughout the country.—Mr. N. CHAMBERLAIN replied: In the present financial circumstance of the country I could not contemplate expenditure on the scale which would be required to carry out the recommendation referred to by my hon. friend. I may, however, say that extensions and improvements of the two existing village settlements are now being carried out with Exchequer assistance and I shall not lose sight of the matter.

Value of Primary Vaccination.

Mr. GROVES asked the Minister of Health whether he could state the considered judgment of the medical advisers of his department with regard to the utility or otherwise of primary vaccination; and whether he contemplated any measures for the obligation to revaccinate quinquennially.—Mr. N. CHAMBERLAIN replied: The answer to the first part of the question is that, in the judgment of my medical advisers, primary vaccination is of great and amply-proved utility. The answer to the second part of the question is in the negative.

Ministry of Health and Small-pox.

Mr. GROVES asked the Minister of Health the reasons why the words about the tragedy of a widespread epidemic of small-pox being realised had been omitted at the end of the first paragraph in the 1924 edition of the Ministry of Health's pamphlet, No. 8, on the subject of small-pox and vaccination.—Mr. N. CHAMBERLAIN replied: The words in question were omitted in view of the general mildness of the type of small-pox prevalent in this country at the time the pamphlet was revised.

Protection against Diphtheria.

Mr. DUNCAN asked the Minister of Health whether the three nurses who contracted diphtheria while attending a case of that disease in the Brentford urban district in March, 1924, as mentioned on p. 55 of the Annual Report of the Chief Medical Officer of the Ministry of Health for

the Year 1924, had been previously immunised against that disease in any way; and whether any of the cases proved fatal.—Mr. N. CHAMBERLAIN replied: The answer to both parts of the question is in the negative. I am, however, informed that one of the nurses, seven months before attending the case referred to, had received a dose of diphtheria antitoxin, but that this dose would not confer immunity for more than one month after it was administered.

Medical Services in Africa.

Dr. SHIELS asked the Secretary of State for the Colonies how much below establishment strength were the medical and sanitary services of Nigeria, Gold Coast, Sierra Leone, Kenya, and Tanganyika, respectively; what steps were being taken to fill the vacancies; and who was responsible for recruiting and selecting the required personnel.—Mr. ORMSBY-GORE (Under Secretary for the Colonies) replied: As regards the West African Medical Staff, at present there are 19 vacancies in Nigeria, 13 in the Gold Coast, and none in Sierra Leone. Nine selected candidates are receiving instruction in this country in tropical medicine and eight more will commence instruction in the new year. There are no vacancies in Kenya and only one in Tanganyika. The vacancies and terms of service are advertised regularly in the medical press, and the attention of the universities and teaching schools is drawn to these services periodically; while advantage is taken of the presence of senior medical officers on leave in this country to visit the medical schools and interest the students in the colonial services. Selection of candidates is made by the Secretary of State with the assistance of a small subcommittee containing two medical men of distinction who advise as to the suitability of candidates who are interviewed by them.

FRIDAY, DEC. 18TH.

Housing.

On the motion for the adjournment,

Mr. T. THOMSON raised the question of housing. He said that under the various Housing Acts there had been erected from 400,000 to 500,000 houses. It was a foolish idea to suppose that that had, or was likely to do away with the shortage which existed in 1919. As a matter of fact the houses which were required to meet requirements and overtake arrears since the Armistice was over a million. The complacent attitude of the Ministry of Health that they were not satisfactorily overtaking the arrears was not a view held by everybody. As the arrears amounted to 500,000 houses it would be another ten years before they could regard the position with equanimity. He was sure that the Minister could not be satisfied with the progress made, and he invited him to tell the House what he proposed to do to expedite building.

Sir LESLIE SCOTT said he found himself in agreement with a great deal which Mr. Thomson had said and he regarded that as symptomatic of the attitude of the House to the housing problem. To a great extent it was getting outside the arena of party politics. They had solved the broad problem of the supply of housing accommodation in the country, though he agreed with Mr. Thomson that they had not yet caught up, or anything like, to the point at which they ought to be and which they must use every possible endeavour to attain as soon as they could. Six years had now passed since the end of the war and the time had come when the slum problem, as a problem somewhat separate from the main housing problem, ought to be tackled in grim earnest. It was a problem which was vitally affecting the efficiency of the whole of our labouring population, and one which they could not afford to leave as it was without using every conceivable effort that either Parliament or the local authorities could possibly make to assist in its solution. A large proportion of the workers of each great city must be housed in more or less the centre, and they must find houses for these people in the centre. The medical officer of health for Liverpool, in his report for the current year, stated that in Liverpool there were at present approximately 2246 houses of the worst type—i.e., back-to-back houses—which were absolutely unfit for anyone to live in for a week. Yet they had been inhabited for years. In addition to that there were some 6000 houses, not back-to-back houses, which the medical officer described as "in such an insanitary condition in respect to structure and sanitary arrangements that they called for improvement." The difficulties in the way of slum clearance were roughly two: In the first place they had to rehouse the displaced population, and that had been in the years since the war the greatest difficulty because of the dearth of houses elsewhere. In the second place there was the cost of acquiring those parts of an unhealthy area which were not actually occupied by insanitary houses and of acquiring land elsewhere within the centre of the city to house the displaced residents during the period while their own area was under reconstruction. If they were going to rehouse on the cleared area anything like the density of population which they were displacing they could not put back small houses. The Act of 1924 and the circulars under the previous Act aimed at 12 houses to the acre, which was too low a number for practical purposes in a large city, much as they would like to attain to it. The only thing was to have large tenement blocks, such as those that have been erected by the London County Council. The practical question was how to make those large tenement blocks as much like real houses as they could. In Liverpool they were proposing to adopt a system of something in the nature of a clearing-house where they could invite the displaced residents to go temporarily while the area was being demolished and rebuilt. They could build the clearing-houses in large tenement blocks of the right kind so that when they were no longer needed as clearing-houses they could be used as permanent houses. A great many local authorities had been prevented from embarking on slum clearance schemes because the cost was prohibitive. There was need for the reconsideration of the whole financial question of the cost in regard to slum clearances. There must be some way of getting on with this question of slum clearances. Either they must tempt local authorities by additional financial assistance, or they must impose upon them greater responsibilities and the Minister must have greater powers to see that those responsibilities were carried out. There ought to be powers of compulsory requisition for the purpose of acquiring sites in connexion with rehousing. Greater powers of town planning and road construction might be given in connexion with large improvement schemes. Thirdly, in regard to such schemes there ought to be a provision for betterment. He thought that the House should ask that this problem should be tackled with a view to the introduction of legislation next session.

Lieut.-Colonel FREMANTLE said that they had got over most of their legislative difficulties in regard to housing and the main thing that they wanted now was good will. They must consider the distribution of housing from a radical point of view. The only ideal at which they ought to aim, the only solution of the problem in the long run, was the creation of new towns on properly selected sites according to schemes well thought out beforehand. They had to persuade factories to move out to such places as Welwyn, and if they did so the workers would be delighted to move out. They had just discovered that the Trade Facilities Act was available to assist factories to be moved out in this way. Let them start this new idea; they had the opportunity now.

Mr. N. CHAMBERLAIN (Minister of Health) said that in the five years period ending 1904, which was the peak period of house-building in this country, the average number built per year was 116,370 of all kinds of houses. In the years 1905 to 1909 the number was 102,706. The figures applied to England and Wales. From 1909 to 1914 the average was 60,648. If one compared that with the 159,000 odd houses built this year and bore in mind that this was a gradually rising figure, he though that the Mrs. Gummidge of the Liberal Party (Mr. T. Thomson) must take heart. They did not need any fresh legislation to get new houses; they were getting them at an increasing rate, and they might be satisfied that they were on the right road, because they were certainly eating into the arrears at a very considerable rate. Every year as some of the more remote places got their needs filled there would be labour and materials released which would come to the assistance of some of the blacker and more difficult spots where there was a great amount of arrears to be made up. They were also making some progress in slum clearances. In the 24 years from 1890 until 1914 only 43 local authorities put forward 71 schemes in all. But in the six years 1919 to 1925, 71 local authorities had submitted 92 schemes, of which 83 had been confirmed. There was also an enormous amount of repairs, alterations and renovations going on all the time. In urban areas alone in the last year for which the complete figures were available—namely, 1923—256,000 houses were made habitable after the service of statutory notices by local authorities. In addition there were a number of houses which were made fit by the urban authorities themselves. Another 253,000 houses had been made fit as a consequence of informal notices given to the owners by the local authority. Something of the same sort of thing was going on in the rural areas. In the same year 49,530 more houses were put into habitable conditions in rural areas under similar proceedings. As regarded the housing of the population in large centres, he did not see at the moment any alternative but to contemplate to some extent the erection of flats, possibly what were called high flats, in some of the more crowded areas to provide for those who found it necessary, or who desired, to live near their work. But they should not imagine that it would always be the case that people would desire to live near their work, nor should they put themselves in a position so that it would be impossible if conditions changed to make better provision for the future. The slum problem was a social as well as a building question. Some education was necessary in the case of some of the slum dwellers to enable them to appreciate surroundings so different from those to which they had been accustomed.

Mr. BALDWIN (Prime Minister) said that for some reason or another which he did not pretend to diagnose it was quite evident that the offer he made in Glasgow in September with a view to encouraging the building of houses in Scotland had failed in its effect. Whereas he had made an offer applying to 4000 houses, the burghs had put in for less than a quarter of the number proposed. The counties had not yet been in a position to advise the Government. In these circumstances he had to announce that the £10 special subsidy scheme lapsed. In its place the Government intended to proceed forthwith with the erection of 2000 houses by alternative methods. They proposed in the first place to utilise the Scottish National Housing Company. The Government would finance the development and take every necessary step to secure its accomplishment. The number of houses was not large and represented barely 1 in 50 of the estimated shortage to-day in Scotland. But he hoped and believed that it would give a push to enterprise in Scotland, whether it be private enterprise or enterprise on the part of the local authorities, so that they might assist in bringing what was in the way of becoming a national scandal in Scotland to an end.

Mr. STEWART (who was Under Secretary to the Scottish Board of Health in the Labour Government) said he would beg the Secretary of State for Scotland and the Board of Health, in the interest of the well-being of the country and its citizens, to prevent, as far as they could, the erection of tenements and above all the development of the room-and-kitchen house. In Scotland they had already 113,000 room and-kitchen houses out a total of 235,000. In Glasgow they were spending in health administration more on the treatment of tuberculosis than Birmingham was spending on the whole of its health administration. It cost them a quarter of a million pounds to deal with the effects of tuberculosis. At the moment they were building a sanatorium that would cost them £500,000, to house 400 people after they had been lucky enough to contract tuberculosis. They would spend over £2 per week per patient to cure them, and then they would send them back once more, with the foolishness that was characteristic of the country in many respects, to the rooms-and-kitchens, and single apartments. In three months, in six months, in nine months they would be back again, and then at the end of five years, after all their money was spent, they would be dead, every one of them.

MONDAY, DEC. 21ST.

Opium Control in India.

Mr. THURTLE asked the Under Secretary of State for India whether the Government of India agreed at Geneva to allow an independent committee of the League of Nations to visit India to examine the control of the opium traffic.—Earl WINTERTON replied: Under the protocol to the Geneva Convention a commission will be appointed by the Council of the League of Nations to decide at the end of five years whether control in the signatory countries is sufficient to prevent completely the smuggling of opium from constituting a serious obstacle to the effective suppression of the use of prepared opium in those territories where such use is temporarily authorised. The protocol has been accepted by the Government of India.

DONATIONS AND BEQUESTS.—Mr John Buchanan Hinshaw, Woolton, Liverpool, after certain legacies and subject to a life interest, gave the residue of his property as to £500 to the Royal Infirmary, Liverpool, and as to £500 to the Bluecoat Hospital, Liverpool.—Mr. Henry Peech, of Ridgway, Wimbledon, Surrey, steel manufacturer, and of Sheffield, who left £107,388, left the greater part of that sum for "such charitable institutions or benevolent objects as he may name in any memorandum and subject thereto as his sister-in-law, Vera Millicent Peech, may select"; but £10,000 is to be paid to Lord Mayor Treloar's Crippled Homes and £5000 to the Sunshine Home for Blind Children, Chorley Wood.—Miss Ellen Jane Sandys, Hove, besides other bequests, left £500 each to the Royal Hospital for Incurables and All Saints' Convalescent Hospital, Eastbourne.—Mrs. Katherine Louisa Ricketts, of Exmouth, who left £13,036, gave £125 each to the British Home for Incurables at Streatham and the Royal Hospital for Incurables, Putney, and the residue of the property as to three-twentieths to the Homes for Aged Poor instituted at Kensington, Paddington, Hammersmith, Battersea, and Norwood in the year 1869; two-twentieths to the Exmouth Local District Nursing Association; six-twentieths to the Home for Incurables at Streatham; six-twentieths to the Royal Hospital for Incurables, Putney; and three-twentieths to the Seamen's Hospital, Greenwich.—Mr. Alfred Frederick Ikin, of Crewe, a brakesman in the employ of the L.M. and S. Railway, has left in his will £1000 to the Crewe Cottage Hospital, with the wish that a bed should be named the Alfred Frederick Ikin bed, in memory of his late wife and himself.

Medical News.

UNIVERSITY OF OXFORD.—In the recent examinations for the degrees of M.B. and B.Ch. the following candidates passed in the undermentioned subjects:—

Medicine, Surgery, and Midwifery.—Francis J. Bach, New Coll.; Leslie J. Barford, Queen's; Reginald H. B. Bettington, New Coll.; Vernon H. Brink, Hertford; Noel Chilton, Brasenose; Alan C. Gairdner, University; Stanford, Howard, Christ Church; Raymond Lewthwaite, Magdalen; Richard G. Mathews, Queen's; Charles W. Simpson, Balliol; David O. Williams, Jesus; Kathleen G. Norton, St. Hugh's; and Nancy B. Ockenden, Lady Margaret Hall.

Materia Medica.—Henry H. Aitchison, Brasenose; John C. K. Chilcott and Cuthbert L. Cope, Exeter; Alan W. Cubitt, Wadham; Samuel B. Davis, Non-Collegiate; John L. Glover, Queen's; Robert E. Havard, Keble; Ensor R. Holiday, Trinity; Harry E. Mansell, Pembroke; and André J. M. Melly, University.

Pathology.—Michael D. Bower, Trinity; Vernon H. Brink, Hertford; Cuthbert L. Cope, Exeter; Walter N. Dickenson, Pembroke; Otto Hooper, University; William H. Hudson, Brasenose; Robert Illingworth, Exeter; Arthur J. Leslie-Spinks, Oriel; Robert G. MacGregor, Worcester; Ripley Oddie, Oriel; David I. Rees, Exeter; Grace Batten, Lady Margaret Hall; and Rosaleen L. Graves and Constance I. Pattullo, Society of Oxford Home Students.

Forensic Medicine and Hygiene.—Reginald H. B. Bettington, New Coll.; Michael D. Bower, Trinity; Vernon H. Brink, Hertford; John C. K. Chilcott, Exeter; Noel Chilton, Brasenose; John H. Chitty, New Coll.; James A. Eyres, Lincoln; Eric L. Fothergill, Keble; Alan C. Gairdner, University; Kenneth A. Hamilton, Christ Church; Reginald A. Haythornthwaite, Keble; Stanford Howard, Christ Church; Thomas C. Hunt, Magdalen; Richard G. Mathews, Queen's; Frederick J. Sale, Christ Church; Samuel Segal, Jesus; Charles W. Simpson, Balliol; Arthur G. Wilson, Brasenose; Edward M. Wright, New Coll.; Margaret N. Jackson, Somerville; and Constance I. Pattullo, Society of Oxford Home Students.

UNIVERSITY OF CAMBRIDGE.—Mr. Joseph Barcroft, M.A., F.R.S., Fellow of King's College, has been elected to the Professorship of Physiology left vacant by the death of Prof. J. N. Langley. Mr. Barcroft gained first-class honours in the Natural Sciences Tripos, Part II., in 1897, with distinction in physiology. He won the Walsingham Medal in 1899 and the Gedge Prize for original observations in physiology. He has held the posts of Oliver Sharpey lecturer at the Royal College of Physicians, University Reader in Physiology, and Fullerian Professor of Physiology at the Royal Institution.

UNIVERSITY OF LONDON.—At a meeting of the Senate held recently, Prof. E. A. Gardner, Vice-Chancellor, being in the chair, it was announced that Prof. A. V. Hill, F.R.S., has, on his appointment by the Royal Society to a Foulerton Chair, resigned the Jodrell Chair of Physiology tenable at University College. He will carry out his research work at University College, and the Senate have resolved that he shall continue to hold the title of Professor of Physiology in the University of London in respect of the functions to be discharged by him at that College.

The following Doctorates have been conferred:—

D.Sc. in Embryology: Mr. A. S. Rau, an internal student, of University College, for a thesis entitled Contributions to Our Knowledge of the Structure of the Placenta of Mustelidæ, Ursidæ, and Sciuridæ.

D.Sc. in Physics: Mr. W. B. Haines, an internal student, of University College and the Rothamsted Experimental Station, for a thesis entitled Studies in the Physical Properties of Soils.

Dr. W. E. Gye was awarded the William Julius Mickle Fellowship for 1926 in respect of the work which he has carried out during the past five years.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—As the result of the Primary Examination for the Fellowship held from Dec. 8th to 17th, for which 130 candidates presented themselves, 40 were approved and 90 were rejected. The following are the names and schools of the successful candidates:—

J. C. B. Allen, Sydney and Middlesex; H. G. Armstrong, Toronto and Middlesex; N. Asherson, Middlesex and Univ. Coll.; M. R. Barrett, Cambridge and St. Thomas's; Geraldine M. Barry, Univ. Coll. and Royal Free; H. O. Blauvelt, Dalhousie and Univ. Coll.; D. H. Brinton, Oxford and St. Mary's; R. C. Brown, Durham and St. Mary's; A. J. W. Chamings, Cambridge and Middlesex; A. E. De Chazal, Univ. Coll. and Middlesex; A. S. El-Katib, Cairo and Middlesex; J. St. C. Elkington, Cambridge and St. Thomas's; E. S. Evans, St. Bart.'s; I. J. Fraser, Belfast and Middlesex; C. R. E. Freezer and G. F. Gibberd, Guy's; J. Gore, Birmingham and Middlesex; G. M. Gray, Aberdeen and Middlesex; E. V. Greeves, Belfast; G. J. Griffiths, Middlesex; S. J. H. Griffiths, Bristol and London; K. H. Hadley, Melbourne and Middlesex; C. W. Harris, Toronto and Middlesex; A. L. P. Jeffery, St. Thomas's;

R. W. Kenney, Dalhousie and Middlesex; D. McKelvey, Edinburgh and St. Mary's; J. D. McLaggan, Aberdeen and Middlesex; I. McPherson, Middlesex; T. J. Millin, Dublin; M. F. Nicholls, Cambridge and St. George's; A. B. Nutt, Sheffield and Middlesex; T. V. Pearce, St. Thomas's; S. R. C. Price, King's Coll.; R. W. Reid, St. Thomas's; M. Rothkopf, Middlesex; H. H. Stewart and G. S. Storrs, Cambridge and St. Thomas's; A. J. Watson, Middlesex; A. S. Wesson, Univ. Coll.; and W. J. Wilkin, Cambridge and St. Bart.'s.

UNIVERSITY OF SHEFFIELD.—At examinations recently held the following candidates were successful:—

FINAL M.B., CH.B. EXAMINATION.

Marjorie T. Crookes, Richard L. Flint, Thomas H. Harrison, John L. Jago, Phyllis A. Moore, and Elisabeth S. M. Sykes.

UNIVERSITY OF MANCHESTER.—At examinations held recently the following candidates were successful in the subjects indicated:—

FINAL M.B. AND CH.B. EXAMINATION.

R. L. Holt (first-class honours, distinction in Medicine and in Forensic Medicine), Louise Aronovich, H. K. Ashworth, Marion L. Bainbridge, C. H. Bamford, A. R. Barber, J. R. Beal, Agnes M. Bodoano, Frances H. Bowden, John Crook, L. F. Evans, S. J. Firth, Beatrice N. Fletcher, J. B. Fulton, Riad Girgis, T. S. Hanlin, Barnett Hirsh, J. T. C. Keddie, Annie T. Leigh, Annie E. Mackintosh, W. D. Mitton, R. J. Owen, R. M. Pearce, Francis Reynolds, Raphael Shaffer, Agnes G. Smiley, Graham Stenhouse, J. K. Thomas, and J. C. Wilson.

Forensic Medicine.—Marguerite E. Cliff, I. H. Freedlander, John Hunt, Harry Pigott, W. S. Slater, and Olive de la W. Turner.

Medicine.—I. H. Freedlander.

Hygiene and Preventive Medicine.—Florence M. Blades, F. S. Hawkins, John Hunt, T. J. Kay, Harry Pigott, and Olive de la W. Turner.

Obstetrics and Surgery.—J. K. Anderson, Frank Appleton, H. K. Ashworth, Frances H. Bowden, George Bridge, Marguerite E. Cliff, T. K. Clifford, Joseph Crowther, Alec Fleming, Beatrice N. Fletcher, C. F. Garfit, Zaky Hanna, G. W. Jones, Annie T. Leigh, Annie T. Mackintosh, C. T. Mills, G. S. de W. Moll, Joseph Parness, Richard Pendlebury, L. C. Peringuey, Harry Pigott, Mary I. Prentice, Francis Reynolds, B. R. Sandiford, Kathleen Sheehan (distinction in Obstetrics), Maurice Sheehan, J. K. Thomas, W. C. D. Walmsley, J. T. Whitley, and Florence Whitrow.

Obstetrics.—R. H. Barnes, J. F. Caithness, A. F. C. Davey, Margaret Dyson, G. D. Hithersay, and J. H. Kitson.

THIRD M.B. AND CH.B. EXAMINATION.

Pathology.—S. K. Appleton, Dorothy Arning, Harold Arstall, A. H. Baker, Dorothy M. Bradley, E. H. Brooks, Agnes N. Buckley (with distinction), M. A. Chamberlain, Frank Cort, E. B. Davies, H. V. Crabtree, Ralph Edmondson, Muriel M. Edwards, Amy H. Herbert, I. M. Hughes, J. H. Jones, J. A. Longworth, Jean McD. Marshall, H. E. Martin, J. S. Miller, J. W. Murray, Robert Newton, Stanley Nowell, J. R. Nuttall, R. P. Osborne, H. A. Palmer, G. H. Racklyeft, Norah Regan, Marshall Robinson, Eleanor B. Schill, Lucy Stokoe, C. E. Sykes, Alfred Thomas, Herbert Townley, Joseph Vine, F. F. Waddy, Josephine Walmsley, K. H. Watkins (with distinction), and Raymond Whitehead.

Pharmacology.—Leslie Bold, E. H. Brooks, Mary G. Davies, Kathleen McGowan, J. W. Murray, G. L. Normington, H. A. Palmer, Henry Tickle, Joseph Vine, and Raymond Whitehead.

UNIVERSITY OF EDINBURGH.—At the graduation ceremonial on Dec. 18th the following degrees were conferred:—

DOCTOR OF MEDICINE.

*George Buchanan, †Andrew J. M. Butter, David D. Dunn, (in absentiâ), John B. Ferguson, †Robert M. Galloway, Henry D. Hayes, *Andrew F. Hewat, Eleanor H. Kelly, †James M'Intyre (in absentiâ), †William F. Mair, John D. Robertson, ‡John P. Stewart, ‡Philip H. J. Turton, and *Alexander B. Williamson (in absentiâ).

*Awarded gold medal for thesis. † Commended for thesis. ‡ Highly commended for thesis.

BACHELOR OF MEDICINE AND BACHELOR OF SURGERY.

William G. Annan, Jack Beinashowitz, George Black, Elisabeth Brearley, Janet H. Brown, Charles D. Bruce, Jean K. Burnie, Alexander Cairns, Elizabeth F. Clark, George H. Clement, Donald M'M. Crawford, John W. Crichton, James P. Dunlop, Thomas MacF. Edward, Phyllis M. Edwards, Sadik L. El-Zik, Stanley Ford, Ian B. Georgeson, Jack Greenstein, John N. Hay, Isabelle W. Horsley, Alan W. Howarth, Evelyn B. B. Humphreys, William A. F. Hurst, John S. Ingles, Norman Kerr, Rachel Knox, Hugh MacCallum, Margaret A. Mackenzie, Alastair K. Mackintosh, Benjamin A. Meyer, Robert S. Mitchell, Makiwane C. C. Motebang, Mungo Park, Alexander G. Paton, George F. Saunderson, John A. R. Selby, William D. M. Sim, Hilton T. Smith, William Steel, Marjorie Steven, Donald Stewart, Meta H. Thomson, and Dorothea E. Walpole.

DIPLOMA IN PUBLIC HEALTH.

Sisir Chandra Chatterjee, John Edgar Haine, John Telfer Smeall.

ROYAL COLLEGE OF SURGEONS OF EDINBURGH.—At a meeting of the College held on Dec. 15th, Dr. A. Logan Turner, President, in the chair, the 25 successful candidates out of 67 entered, who passed the requisite examinations between Sept. 28th and Oct. 5th, were admitted Fellows:—

Harold E. Alexander, Nathaniel Beattie, Mervyn H. Elliot-Smith, Frederick G. Gibbs, Christian F. Krige, Ian H. McClure, Archibald D. McKenzie, Eric S. McPhail, David M. Mitchell, William B. R. Monteith, William Morrison, Douglas L. Muir, Clarence E. Nelson, Edwin R. Ormerod, David R. Owen, John A. Panton, Douglas W. L. Parker, Arnold Perry, Douglas C. Pigdon, James G. R. Scarff, Ian D. Stronach, Thakurdas Chuharmal Ramchandan, Robert Whillis, Rowland P. Wilson, and Dadabhoy Dinsahw Variava.

UNIVERSITY OF DURHAM: FACULTY OF MEDICINE. At examinations held recently the following candidate were successful:—

THIRD EXAMINATION FOR DEGREES OF BACHELOR OF MEDICINE AND BACHELOR OF SURGERY.

Materia Medica, Pharmacology, and Pharmacy; Public Health; Medical Jurisprudence; Pathology and Bacteriology.—Harold C. Beck, Thomasina Belt, Thomas S. Blaiklock, Ida M. Dodds, Walter Foskett, William A. Kirkpatrick, Leonard H. Lerman, Jerome A. O'Callaghan, William Stevenson, Alfred T. G. Thomas, Edward C. Vardy, and Thomas Welsh.

The Duchess of York has consented to become President of the South London Hospital for Women, Clapham Common.

ROYAL SANITARY INSTITUTE.—The courses of lectures and demonstrations arranged for next term will begin early in January. The first lecture of the course for sanitary inspectors will be delivered on Jan. 4th by Dr. Charles Porter, and the first lecture of the course for meat and food inspectors will be delivered on Feb. 5th by Mr. J. R. Hayhurst. Further information can be obtained from Mr. E. White Wallis, director and secretary, at the Institute, 90, Buckingham Palace-road, London, S.W. 1.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION.—A further series of open lectures has been arranged from Jan. to March on general subjects. Dr. Herbert Spencer will give the opening lecture on Abdominal Palpations in Pregnancy (with lantern demonstration) on Thursday, Jan. 21st, at 5 P.M., in the Lecture Hall of the Medical Society of London, 11, Chandos-street, W. From Jan. 11th to 23rd the Prince of Wales's General Hospital will hold an intensive course in general medicine, surgery, and the special departments. The daily lecture at 4.30 P.M. is free to members of the Fellowship of Medicine. During January, beginning on the 4th, a series of lecture-demonstrations on Psychological Medicine has been arranged for Tuesdays and Saturdays, at 11 A.M., at the Bethlem Royal Hospital. Also beginning on Jan. 4th a four weeks' course of lectures and demonstrations in the Diagnosis of Nervous Diseases will take place at 5 P.M. at the West End Hospital. At the North-Eastern Hospital a three weeks' course in Infectious Fevers will be given on Wednesdays, at 2.30 P.M., and Saturdays, at 11 A.M., from Jan. 11th to 30th. An all day course has been arranged in Diseases of Children at the Queen's Hospital from Jan. 18th to 30th. Another whole day course will take place from Jan. 18th to 30th at the National Hospital for Diseases of the Heart. From Jan. 11th onwards it is intended to hold special weekly demonstrations in clinical surgery. The first of these will be given at 5 P.M. at St. Mark's Hospital by Mr. J. P. Lockhart-Mummery, and subsequent announcements will appear in the Medical Diary. A copy of each syllabus of the foregoing courses and of the Fellowship General Course programme may be obtained on application to the secretary at 1, Wimpole-street, London, W. 1.

ROYAL INSTITUTION OF GREAT BRITAIN.—The one hundredth course of Christmas lectures adapted to a juvenile auditory will be delivered at 3 P.M. on Dec. 29th and 31st, and Jan. 2nd, 5th, 7th, and 9th, by Sir William Bragg, F.R.S. The title of the lectures is Old Trades and New Knowledge, and the individual lectures deal with the following trades: (1) the trade of the sailor; (2) of the smith; (3) of the weaver; (4) of the dyer; (5) of the potter; (6) of the miner.—The first Friday evening discourse in 1926 will be held at 9 P.M. on Jan. 22nd, when Sir William Bragg will speak on the Work of the Davy Faraday Research Laboratory. On the 29th Sir William B. Hardy, F.R.S., will speak on Films.—Among the general courses of lectures to be delivered before Easter, 1926, is one on Jan. 19th and 26th, at 5.15 P.M., on X Rays and Living Matter, by Prof. J. A. Crowther. Dr. Eric K. Rideal will lecture on Surface Action at 5.15 P.M. on Feb. 2nd and 9th. Prof. Joseph Barcroft, F.R.S., will lecture at 5.15 P.M. on Feb. 16th, 23rd, March 2nd and 8th on the Egg—(1) introductory, (2) the shell, (3) the yolk, and (4) the white. On March 16th and 23rd, at 5.15 P.M., Prof. Cecil H. Desch, F.R.S., will lecture on the Growth of Crystals. Prof. Charles J. Patten will give two lectures at 5.15 P.M. on Jan. 21st and 28th, one entitled the Language of Birds, and the second the Breeding Factor in Birds. Further information may be obtained from the secretary at the Royal Institution, Albemarle-street, London, W. 1.

POPLAR HOSPITAL FOR ACCIDENTS.—At the festival dinner last week Sir Alan Anderson stated that during the past year the hospital had broken records in annual subscriptions, donations, and out-patients' attendances, while the dinner collection, £13,600, was the largest that had ever been known.

APPROVED INSURANCE FUNDS AND MANCHESTER CANCER APPEAL.—At a meeting of the National Union of Trade Union Approved Societies, it was stated that having regard to the occurrence of cancer of the scrotum in the spinning room, the executive of the Operative Cotton Spinners' Association desired to contribute to the appeal recently made. An application was made to the Ministry of Health regarding a proposed gift of £1000 to the Cancer Fund from the approved insurance funds. The Ministry replied that such a gift could not be made under Section 26, because the Manchester Cancer Research Committee was not a charitable institution.

Appointments.

CUMMING, W. M., M.B., Ch.B. St. And., D.P.H., has been appointed Senior Assistant Medical Officer, Grove Park Hospital, for Tuberculosis.

LITTLE, C. E., M.B., Ch.B. St. And., to be Certifying Surgeon under the Factory and Workshop Acts for the Rhyl District of the County of Flint.

Vacancies.

For further information refer to the advertisement columns.

Ascot, Heatherwood Hospital.—Res. Asst. M.O. £300.
Bedford County Hospital.—Asst. H.S. At rate of £130.
East Sussex County Mental Hospital, Hellingly, Sussex.—Pathologist. £500.
Hospital for Sick Children, Great Ormond-street, W.C.—Res. Med. Supt. £300.
Ipswich, East Suffolk and Ipswich Hospital.—H.P. and H.S.'s. Each at rate of £100.
Keighley, Victoria Hospital.—Res. M.O. At rate of £180.
Leeds Public Dispensary.—Jun. Res. M.O. £150.
London Lock Hospital, 283, Harrow-road, W., and 91, Dean-street, W.—Hon. P.
London Temperance Hospital, Hampstead-road, N.W.—Cas. O. At rate of £120.
Manchester, Ancoats Hospital.—Visiting Dental S.
Manchester City Education Committee.—Asst. Sch. M.O. £600.
Manchester Hospital for Consumption, &c.—Res. M.O. £200.
Maudsley Hospital, Denmark Hill, S.E.—Deputy Med. Supt. £850.
Mildmay Mission Hospital, Austin-street, Bethnal Green, E.—Radiologist.
Plymouth, Didworthy Sanatorium, South Brent.—Res. M.O. £600.
Royal Free Hospital, Gray's Inn-road, W.C.—Second H.P.
St. Mark's Hospital for Cancer, Fistula, &c., City-road, E.C.—Radiologist. £25.
St. Mary's Hospital, Institute of Pathology and Research, Paddington, W.—Research Studentship. At rate of £200.
St. Mary's Hospital, W.—Asst. M.O. in charge of X Ray Dept.
Salisbury General Infirmary.—H.S. £150.
Southport Convalescent Hospital and Sea-Bathing Infirmary.—Res. Med. Supt. £600.
West London Hosp., Hammersmith-rd., W.—Hon. Obstet. Reg.
Wolverhampton and Staffordshire Hospital.—Res. Surg. O. £250.

Births, Marriages, and Deaths.

BIRTHS.

ANDREW BIRD.—On Nov. 22nd, at Lumeah, 101 Kitano-cho, 2-Chome, Kobe, Japan, the wife of Dr. G. Andrew Bird—a daughter.

BAILEY.—On Dec. 13th, at Denburgh Park, Banstead, the wife of R. J. Bailey, L.D.S., of a son.

MARRIAGES.

DUNLOP—HEATH.—On Dec. 14th, at Old Greyfriars, Edinburgh, Gavin Alexander Dunlop, M.B., Ch.B., to Rosamond, daughter of Mr. and Mrs. Heath, Hanworth, Middlesex.

TUNBRIDGE—RODDY.—On Dec. 15th, at Holy Trinity Church, Leamington Spa, William Stephen Tunbridge, M.A., M.B., B.Ch. Oxf., to Mildred Emma Leathes, the younger daughter of Colonel Roddy, C.B., and Mrs. Roddy, of Bareilly, Leamington.

DEATHS.

MCILROY.—On Dec. 16th, at The Priory, Rochampton, John Morrison McIlroy, M.R.C.S., L.R.C.P., in his 65th year.

POWELL.—On Dec. 15th, at Cleveland-square, W., Sir Richard Douglas Powell, Bart., K.C.V.O., M.D., aged 83.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Notes, Comments, and Abstracts.

AN ALPINE THERMAL STATION.

BY T. N. KELYNACK, M.D. MANCH., M.R.C.P. LOND.,
SENIOR PHYSICIAN TO MOUNT VERNON HOSPITAL.

LOECHE-LES-BAINS, Leukerbad—or simply Baden as it is known locally—occupies a unique position among European thermal stations. Its natural hot springs are in character and therapeutic properties similar to the famous waters of Bath.

Situation and History.

Leukerbad, with a normal population of 600 souls, is situated in the Canton of Valais in the picturesque valley of the Dala at an altitude of 4630 feet, just below the impressive Gemmi Pass, surrounded by green flower-laden pastures, high alps on which cattle graze, and mules climb in summer,

Loeche-les-Bains with the rocky wall of the Gemmi behind.

dense forests of pines, sparkling glaciers, and snow fields with rocky peaks from which unrivalled panoramas of the snow-clad mountains of the Bernese Oberland and the giants which lie to the south of the Rhone can be obtained. The village, tucked away as it is on the north side of the Rhone Valley, can yet be readily reached. The Simplon Express from Calais passes through Leuk from whence a narrow-gauge electric and rack-and-pinion railway bringing the traveller direct to the baths of Leuk in an hour. There is a good road 17 km. long up the valley suitable for skilled motorists.

Leukerbad, there is reason to believe, was known to the ancient Gauls and, like our own Bath, was discovered by the Romans. It is thought that in the first centuries Christian sick folk resorted to the hot springs, but it was probably not until the end of the fifteenth century that the fame of the waters extended to other countries. By 1500 the bathing establishments had developed into important and valuable properties.

The Thermal Springs.

The natural hot springs known to exist are over a score in number; of these the most important are now associated with five hydrotherapeutic establishments, giving systematic courses of baths. Each of the principal baths is connected by covered ways with one or more of the chief hotels, so that the patient can pass directly from his own room to the hot waters. The principal hotels and baths are under one control. The season extends from early in May to the beginning of October, and during recent years endeavours have been made to develop the place as a winter sports station with a season extending from Dec. 15th to the end of February.

The temperature of the water varies from 102° to 124° F. It is conjectured that the depth of the springs is at least 5000 feet, but the conditions which give rise to thermal springs of such constancy are not exactly known. The water is clear and almost tasteless. Chemical analysis shows the presence of sulphates of calcium, magnesium, sodium, and strontium; carbonates of calcium, magnesium, manganese, and iron; chlorides of potassium, sodium, ammonium, and lithium; with traces of alum, silica, arsenic, carbonate of copper, and sulphate of barium. Recent investigation has shown that the waters have radio-active properties.

Bathing Régime.

Patients entering on a course of hydrotherapeutic treatment are expected to consult one of the two doctors in residence during the summer—Dr. A. Bayard and Dr. R.

Zen-Ruffinen—with a view to direction regarding the form, application, and duration of the baths with such other treatment as may be desirable. A full course of baths extends usually over three weeks. The baths are open from 5–12 A.M. Patients generally take their petit déjeuner (coffee and milk, fresh rolls and butter, and conserves) at 7 A.M. while in the bath, served on a tray placed on wooden floats. In addition to the public baths there are family and private baths for individuals. Patients remain in the baths for periods up to several hours, afterwards resting for some considerable time in their own rooms. Thus, in the majority of cases the whole morning, up to déjeuner at 12.30, is devoted to treatment. Along one side of the Grand Bain, connected with the Maison Blanche, is a gallery to which spectators on removing their hats are admitted and who are expected to drink of the waters and contribute a trifle pour les pauvres. At each of the baths are experienced attendants who carry out special forms of hydrotherapeutic treatment and massage. In addition to the baths patients drink the waters and have their rest and exercise regulated. The dietary varies considerably according to the hotel chosen. In addition to the larger hotels and hydropathic establishments, there are a number of inns frequented by tourists.

Indications.

Among the diseases for which the baths at Leuk have proved beneficial are various forms of chronic inflammatory affection, rheumatoid and other arthritis, gout, lumbago, fibrositis, sciatica, and other neuritic conditions; varicose veins, phlebitis, and chronic ulceration of the lower extremities; catarrhal states involving the mucous membranes of respiratory and urogenital tracts; certain skin diseases and renal affections; neurasthenia and convalescence from various acute diseases. For overworked, brain-fagged men and women a course of treatment in this restful mountain station with its invigorating air is often of benefit.

There is a public bath hospital with which is associated, in a separate building, a series of baths. Residence in the hospital, which is under the care of Catholic sisters, and treatment in the baths is available at low fees for suitable necessitous cases from all countries.

On the north side of the village, close to the main road which descends to the Rhone Valley, is an open spring where hot water bubbles up. Simple wooden benches have been erected over the water, and at this spring, open to all comers free of any charge, are to be seen children and village folk side by side with men and women of all sorts and conditions. Partial immersion in this spring produces marked local reaction and is quickly followed by a general reaction. Immersion of feet and legs in the hot spring after a mountain excursion brings about a sense of warmth and comfort. I noticed an old lady with marked arthritis of the knee-joint spreading over the swollen part some of the fine alluvial deposit to form a kind of radio-active paste.

Amenities and Access.

For the young and vigorous there are numberless charming walks and climbs, while for the delicate and elderly there are many and varied walks on easy gradients. There is a Roman Catholic parish church, a Protestant chapel at which services are held in English and French, a chemist and shops in which all the requirements of the visitor can be met. Guides and porters with mules can be obtained by those desiring excursions in the high mountains.

Loeche-les-Bains is a favourite resort with Swiss doctors, and the thermo-mineral springs at this picturesque mountain health station might be better known by British practitioners. The manifold forms of rheumatism, osteo-arthritis, fibrosis, neuritis, and allied affections would reap benefit by a holiday at Loeche-les-Bains and a course of its wonderful thermal baths. Mr. Wattelet, director of the Société des Hôtels at Loeche-les-Bains, will furnish English doctors with full particulars regarding the baths and hotel facilities. A return ticket from London to Loeche-les-Bains costs first-class from £10 9*s.* 5*d.* to £8 18*s.*, second-class, £7 11*s.* 8*d.* to £6 6*s.* 7*d.*, according to route. Full particulars regarding travel can be obtained from the various travel agents or from the London office of the Swiss Federal Railway, 11B, Regent-street, S.W. 1.

THE NEW HEALTH SOCIETY.

A NEW Health Society, or rather "The New Health Society," of which Sir W. Arbuthnot Lane is president, was launched on Dec. 11th at a luncheon given by the Aldwych Club, whose president, Alderman Sir Charles Wakefield, was in the chair. Lord Oxford and Asquith said the aim of the society was not so much to cure the ill as to keep the people well. In England and Wales £12,000,000 were spent annually on sickness and disability benefits for illness that might be prevented. Many diseases were due to artificial methods of our civilisation, and in particular to diet; 80 per cent. of the most disabling forms of illness were due not to malnutrition, but to wrong feeding, too much meat, too little milk. The society would work with the family doctor and the specialists. Its main business was to disseminate knowledge of the laws of health and the causes of disease. New methods had reduced the prison population, new methods would, he hoped, lessen the strain on the voluntary hospitals. Mr. Philip Snowden said that we lost in industry, from physical weakness, £400,000,000 worth of work every year. To advise more milk was good, but to provide more milk for the children was more important. He hoped that the alcohol question and waste therefrom would not be forgotten. Subscriptions were asked for, and £525 at once given.

On the evening of Dec. 12th Lady Oxford and Asquith broadcasted an appeal from London on behalf of the new society. She had just read how Queen Elizabeth got herself a bathroom, in which she expected to be able to have a bath every three months, whether she needed it or not. That was in the bad old days, as they should be called, when medicine was superstition mainly, when people believed in witchcraft, and no one knew how to get rid of diseases like plague, rampant everywhere. Our present outlook was wide, hospitals were nearly perfect, and our great hope was in prevention, and we wanted all to be fit. But not everyone knew how to keep fit; it was part of the work of this society to show them. It would bring benefits to large employers of labour, whose staffs are reduced by illness, to mothers whose children it would save. It would, Lady Asquith concluded, help the doctors, and would financially benefit the country as much as 2*s.* off the income-tax.

A STOLEN CAR.

To the Editor of THE LANCET.

SIR,—My car was stolen yesterday by the following *modus operandi*. One confederate stands by the surgery door whilst the other hides on the remote side of the car, and, if disturbed, the former says, "Will you come round to Mrs. Collins—a midwifery case—*not* at once, but after surgery will do." And whilst the doctor is investigating the particulars (which were lies) the confederate starts the car and they go off together. Will anybody assist in detaining this man if he calls with such a cock-and-bull story.—I am, Sir, yours faithfully,

Trinity-sq., Southwark, S.E., Dec. 16th. R. LARKIN, M.D.

*** We are glad to learn that Dr. Rance Johnson of Hampstead, whose car was stolen while he was seeing a patient in Bedford-square on Dec. 17th, has recovered it through the police, albeit in damaged condition. Dr. Johnson suggests that companies insuring motor-cars for medical men should insert a special clause in the agreement making an allowance for hire during the temporary loss of a car from accident or theft.—ED. L.

CALENDARS AND DIARIES FOR 1926.

A CONVENIENT block calendar for 1926 (The A.F.D. Diary) has been issued by the Anglo-French Drug Co. (238A, Gray's Inn-road, London, W.C.1). There is provided for each day throughout the year a sheet of white paper, 4 inches square, for written memoranda, and the stiff hinged cover provided preserves the privacy of the notes and lends the calendar the appearance of a bound book. A certain number are available gratis to medical men on application to the company.

INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED DEC. 12TH, 1925.

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 144 (previous weeks 115 and 105); scarlet fever, 1962; diphtheria, 986; enteric fever, 37; pneumonia, 1917 (previous weeks 1176, 1531, 1186, and 889); puerperal fever, 63; cerebro-spinal fever, 10; acute poliomyelitis, 10; acute polio-encephalitis, 1; encephalitis lethargica, 44; dysentery, 9; ophthalmia neonatorum, 112. There were no cases of cholera, plague, or typhus notified during the week.

The cases of small-pox were reported from the following counties: Derby, 21 (Derby C.B. 6, Bolsover 2, Blackwell R.D. 13); Durham, 87 (Gateshead C.B. 2, South Shields C.B. 1, Sunderland C.B. 1, Blaydon 52, Ryton 2, Seaham Harbour 1, Stanhope 2, Whickham 4, Chester-le-Street R.D. 3, Easington R.D. 3, Houghton-le-Spring R.D. 6, Lanchester R.D. 5, Sunderland R.D. 5); Northumberland, 5 (Newcastle-upon-Tyne C.B. 4, Castle Ward R.D. 1); Nottingham, 16 (Nottingham C.B. 3, Hucknall 2, Mansfield 1, Sutton-in-Ashfield 7, Southwell R.D. 3); Yorks, East Riding, 6 (Kingston-upon-Hull C.B.); Yorks, West Riding, 9 (Rotherham C.B. 1, Sheffield C.B. 2, Hipperholme 1, Rawmarsh 4, Halifax R.D. 1).

Deaths.—In the aggregate of great towns including London, there were 7 deaths from enteric fever (London 4), 71 from measles, 17 from scarlet fever, 44 from whooping-cough, 38 from diphtheria, 116 from influenza (previous weeks 100, 73, 61, and 44). In London itself there were 21 deaths from measles, 12 from diphtheria, and 22 from influenza.

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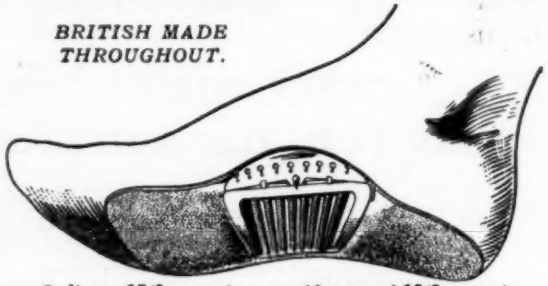

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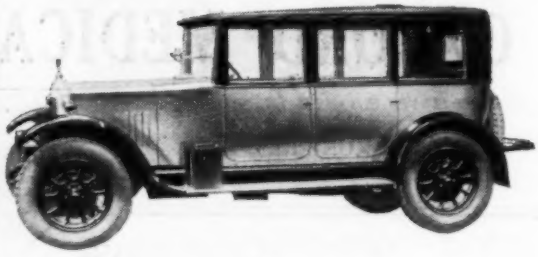

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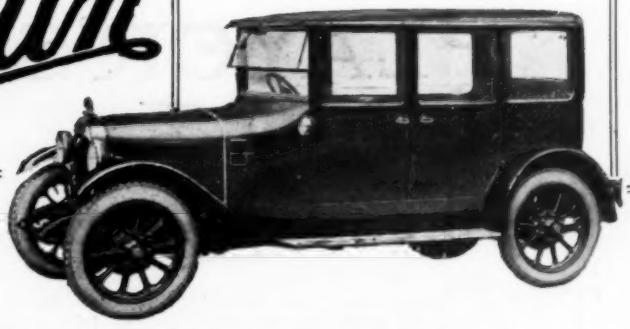

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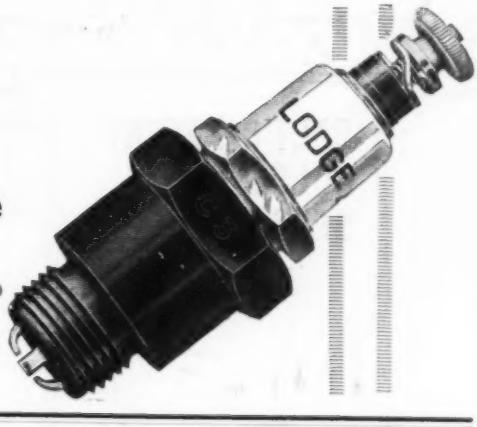

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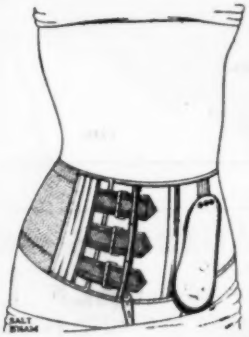

Fig. 1. Shows the moulded rubber cup (which may be boiled). The pad is indicated by "A" and rim (which when in position is *outside* belt), is shown at "B," which holds the mouth of the indiarubber bag.

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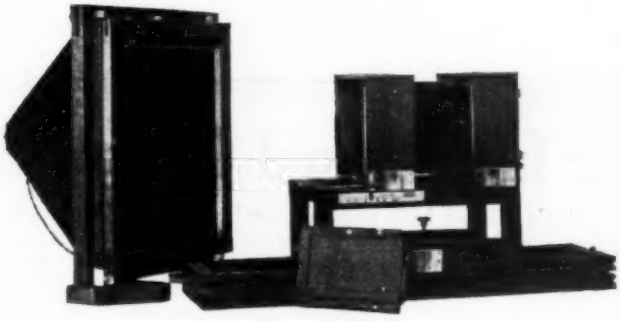

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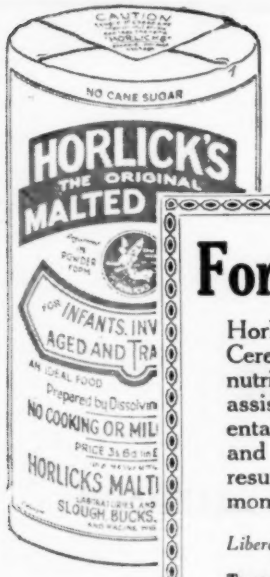

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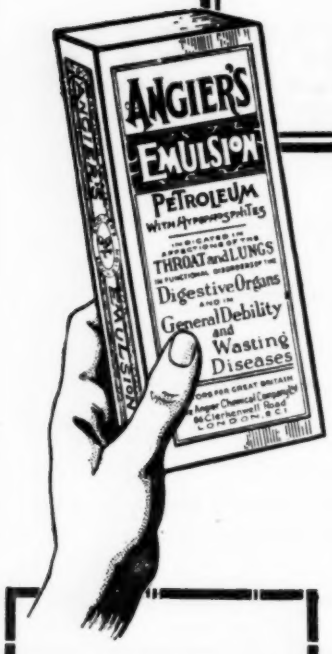

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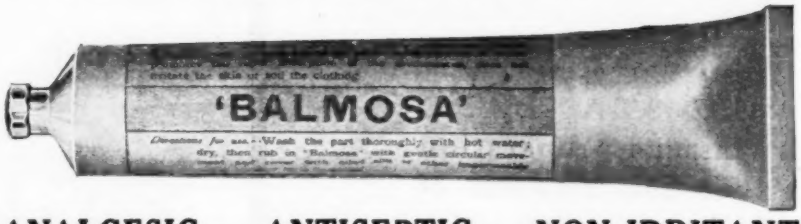

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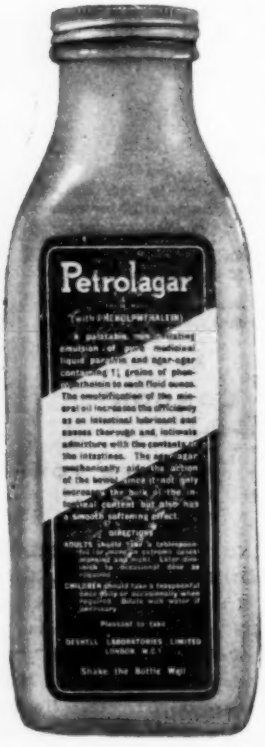

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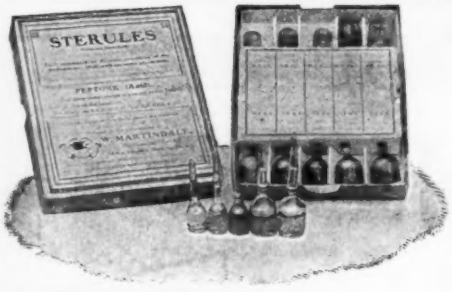

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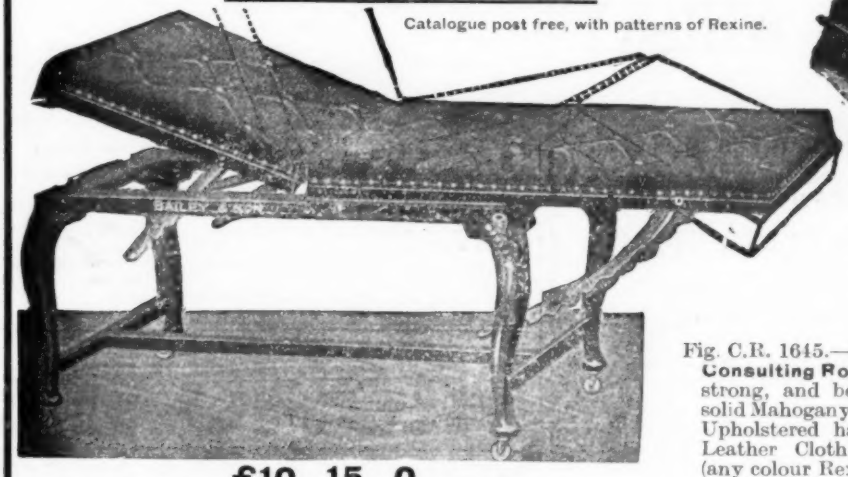

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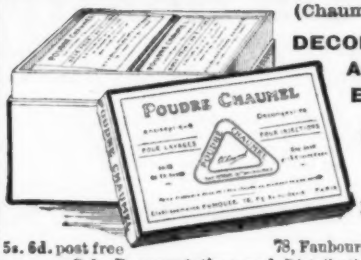

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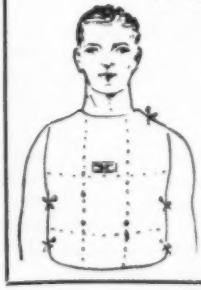

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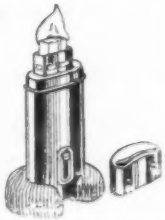

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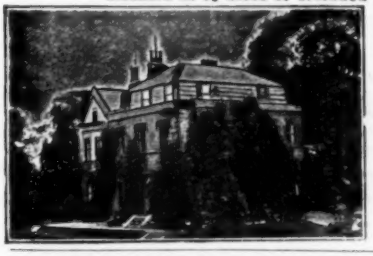

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Completely detached Villas for Mild Cases, with private suites if desired. Voluntary Patients received. Twenty acres of grounds. Hard and Grass Tennis Courts, Croquet, Squash Rackets, and all indoor amusements, including Wireless and other Concerts. Daily Services in Chapel.

Senior Physician: DR. HUBERT J. NORMAN, assisted by three Medical Officers, also resident.

An Illustrated Prospectus, giving full particulars and terms, may be obtained upon application to the Secretary.

HOVE VILLA, BRIGHTON.—A Convalescent Branch of the above.

THE ROYAL EARLSWOOD INSTITUTION FOR MENTAL DEFECTIVES

(Formerly the EARLSWOOD ASYLUM.)

REDHILL, SURREY.

FOR THOSE REQUIRING CONTROL with EXPERT SUPERVISION and needing SPECIAL TRAINING in useful occupations. **SCHOOLS, FARMING, and various TRADE WORKSHOPS.**

SELECTED CASES admitted on reduced inclusive fees. **THOSE UNABLE TO PAY** admitted by votes of Subscribers, with part-payment towards cost.

RECREATIONS: ALL outdoor games, EXCELLENT BAND by Male Staff, for Concerts, Dancing, &c.

Apply THE MEDICAL SUPERINTENDENT, Earlswood, Redhill, Surrey, or to the Secretary, Mr. H. STEPHENS, 14-16, Ludgate Hill, E.C.
Telephone: Redhill 344. Telephone: Central 5297.

NEW SAUGHTON HALL

THE ONLY PRIVATE HOSPITAL for the TREATMENT of MENTAL CASES in SCOTLAND

POLTON, MIDLOTHIAN.

NEW SAUGHTON HALL, which takes the place of Saughton Hall, established in 1798, is situated seven miles south of Edinburgh, in the beautiful neighbourhood of Hawthornden and Rosslyn, and is surrounded by picturesque and well-timbered pleasure grounds extending to 125 acres.

Railway Stations—Polton, five minutes; and Loanhead, ten minutes' walk from the Institution—reached in half-an-hour from the Waverley Station, Edinburgh. Telephone—4 Loanhead.

Forms of admission for voluntary or certified cases, full instructions, &c., can be obtained on application to the Resident Medical Superintendent, S. RUTHERFORD MACPHAIL, M.D.Edin. Inclusive terms from £165 to £500 per annum, according to requirements.

The OLD MANOR, SALISBURY, WILTS.

Telephone 51.

Private Hospital for the Care and Treatment of those of both sexes suffering from Mental Disorders.

Extensive grounds. Detached Villas. Chapel. Garden and dairy produce from own farm. Terms very moderate

Illustrated Brochure on application to the Medical Superintendent.

NORTHUMBERLAND HOUSE,

GREEN LANES, FINSBURY PARK, N.4.

Telegrams: "SUBSIDIARY, LONDON." Telephone: North 888

A PRIVATE HOME for the treatment of patients of both sexes suffering from Mental Illnesses.
Conveniently situated four miles from Charing Cross. Easy of access from all parts.
Six acres of ground, highly situated, facing Finsbury Park.
Voluntary Boarders received without certificates. Private suites. Seaside Branch at Worthing.
For particulars, apply to the MEDICAL SUPERINTENDENT.

YARROW HOSPITAL for CHILDREN BROADSTAIRS.

For the Early and Preventive Treatment of Disease and Convalescence after illness.

FOR CHILDREN OF WELL-EDUCATED PEOPLE OF VERY LIMITED MEANS.

Charge, 10s. per week for each Child.

This fee is subject to addition or deduction according to Parents' means.

100 Beds. Boys, ages 4 to 12. Girls, ages 4 to 14.

The usual stay is 4 weeks, but some wards are reserved for serious cases requiring special treatment, and for these a lengthened stay may, under some circumstances, be granted, and the age limit raised to 14 for Boys and 16 for Girls

The Hospital faces the sea, and is open all the year, being as well adapted for winter as for summer residence.

Particulars can be obtained from the SECRETARY, 116, VICTORIA ST., WESTMINSTER, LONDON, S.W.1.

THE COTSWOLD SANATORIUM.

private sanatorium specially built in 1898 on the Cotswold Hills, seven miles from Cheltenham, for the treatment of Pulmonary and all other forms of Tuberculosis on Nordrach lines. Aspect S.S.W., sheltered from North and East, elevation 800 ft. Pure bracing air. **SPECIAL TREATMENT** by artificial **PNEUMOTHORAX** (X-ray controlled), **TUBERCULINS, VACCINES,** and **ULTRA-VIOLET RAYS** (Mercury Vapour Arc Lamp) is available without extra charge. **X-RAY** plant. Electric light. Radiators with hot and cold basins in all rooms. Full day and night Nursing Staff.

Resident Physicians: ARTHUR H. HOFFMAN, M.D., and GEOFFREY A. HOFFMAN, M.B.

Apply: Secretary, Cotswold Sanatorium, Cranham, Gloucester.

Telephone: 22 Painswick. *Telegrams:* Hoffman, Birdlip.

PRIOR PLACE SANATORIUM

HEATHERSIDE, CAMBERLEY.

RECENTLY OPENED FOR THE TREATMENT OF PULMONARY TUBERCULOSIS

WELL SITUATED ON HIGH GROUND AND SURROUNDED BY PINES AND HEATHER.

RESIDENT MEDICAL SUPERINTENDENT: DR. H. O. BLANFORD, late Medical Superintendent, King Edward VII. Sanatorium, Midhurst, to whom applications for particulars may be made.

THE DEESIDE SANATORIA IN SCOTLAND

FOR THE OPEN-AIR TREATMENT OF

PULMONARY TUBERCULOSIS and ALLIED DISEASES

At BANCHORY and MURTLE.

Medical Director - - DAVID LAWSON, M.A., M.D., F.R.S.E.

These Sanatoria are situated amidst **Ideal Surroundings in Middle Deeside**, the reputation of whose **Climate** in the treatment of Lung Diseases is well established.

Both Institutions are well equipped with **Research Laboratory, Throat Room, Dental facilities**, and powerful **X-Ray Plant. Full Day and Night Nursing Staffs** are employed.

Special Treatment by artificial **Pneumothorax** (with X-ray Control), the various **Tuberculins**, and Autogenous **Vaccines**, &c., is available without extra charge.

NORDRACH-ON-DEE

At BANCHORY, near BALMORAL.

Physician - - - - DR. IAN STRUTHERS STEWART.
Assistant Physician - DR. C. F. MARR.

Inclusive terms £7 7 0 per week.

A limited number of larger rooms at £9 9 0.

For particulars apply to the Secretary.

TOR-NA-DEE SANATORIUM

At MURTLE, ABERDEENSHIRE

Senior Physician - - DR. J. M. JOHNSTON.
Assistant Physicians - DR. R. J. DUTHIE & DR. H. TRAIL.

Inclusive terms 7 guineas a week.

For further particulars apply to the Secretary.

The Scottish Branch of the British Red Cross Society is prepared to contribute towards payment of the fees of ex-Officers and Nurses recommended by the Society and such Officers and Nurses obtain priority of admission to TOR-NA-DEE.

PALACE SANATORIUM,
MONTANA - SUR - SIERRE.

Altitude 5,000 feet.
Sunniest Health Resort
in the Alps.

PALACE SANATORIUM

Montana, Switzerland.

For the Treatment of all forms of

TUBERCULOSIS,

ASTHMA, and other diseases of the Respiratory Tract.

Sheltered situation, facing south, magnificent mountain panorama.

Modern equipment, including roof solarium, Throat Room, Clinical Laboratory, and recent X-Ray plant.

Day and night staff of English trained nurses.

Pneumothorax treatment available without extra charge.

Resident Medical Officers:

ANDREW MORLAND, M.B., B.S.Lond.
ERIC ZIMMERLI, M.D. Basle, M.R.C.S., L.R.C.P. England.
H. J. ROCHE, M.D. Melb., M.R.C.P. Lond.

Inclusive terms from 7 guineas a week in winter and from 6 guineas in summer.

Particulars from

MEDICAL SUPERINTENDENT, or from THE SECRETARY, 5, Endsleigh Gardens, London, N.W.1.

MENDIP HILLS SANATORIUM

Specially built, facing south. 300 acres of Sanatorium grounds—meadow and woodland; sheltered pine avenues. Altitude 850 ft. Magnificent view for miles south; hot-water radiators and electric light in each room and châlet.

All forms of treatment, including Ultra-violet and X-rays, Vaccines, and Pneumothorax in suitable cases. Trained Nurses. Individual attention.

For particulars, apply SECRETARY, Hillgrove, Wells, Somerset. *Telegrams: Hillgrove, Wells, Somerset.*

Resident Physician: DR. T. C. BRENTNALL.

RUTHIN CASTLE

(Formerly Duff House, Banff).

The first Private Hospital in the United Kingdom to be fully provided with a whole-time specially qualified Staff of Doctors, Analytical Chemists, Bacteriologists, Radiologists, Nurses, Dietists, Masseurs, and Masseuses, and a full equipment of Laboratories, X-rays, Electrocardiograph, Artificial Sunlight, and Medical Baths.

The Hospital is equipped for the diagnosis and treatment of any form of ill-health, except Mental and Infectious Diseases. The fees are inclusive.

The climate is mild and the neighbourhood beautiful.

Apply: THE SECRETARY, Ruthin Castle, North Wales.

Telegrams: CASTLE, RUTHIN. *Telephone:* 66 RUTHIN.

PENDYFFRYN HALL SANATORIUM (Est. 1900)

Artificial Pneumothorax (X-ray Control) and all Modern Methods of Treating Tuberculosis available under Ideal Conditions. Insulin Administration (with Blood Sugar Control) available for Diabetic Cases.

For full particulars apply to the Resident Physician (**Dr. B. ASH**), PENDYFFRYN HALL, PENMAENMAWR, N. WALES. ('Phone 20).

FARMWOOD SANATORIUM, ASCOT.

This Sanatorium provides for the treatment of patients suffering from Pulmonary and other forms of Tuberculosis.
Medical Staff—A Consulting and a Visiting Physician.
Nursing Staff—Fully Trained Night and Day Staff.
Terms from 7 guineas a week. There are no extras. One hour from London by road or rail.

For full particulars apply to the SECRETARY, FARMWOOD, ASCOT.
Tel: Ascot 519.

INEBRIETY.

[Telephone: 16 Rickmansworth.

DALRYMPLE HOUSE, RICKMANSWORTH, HERTS.

For the treatment of Gentlemen under the Act and privately. Established 1883 by an association of prominent medical men and others for the study of inebriety; profits, if any, are expended on the institution. Large secluded grounds on the banks of the river Colne. All kinds of out-door and in-door recreations and pursuits.—For particulars apply to F. S. D. HOGG, M.R.C.S., &c., Resident Medical Superintendent.

BAY MOUNT, PAIGNTON

ALCOHOLISM, DRUG HABIT, NEURASTHENIA.

Ladies and Gentlemen received.

Small, select home, standing in 3½ acres of secluded gardens overlooking Torbay, near Torquay. Billiards, golf, tennis &c. Every case treated with a view to rapid and permanent cure by up-to-date scientific methods. Consultations, Harley Street, by appointment.

Prospectus, yearly report, etc., from SEC. or STANFORD PARK, M.B., Res. Med. Supt. Tel.: Paignton 511o.

PEEBLES HYDRO.

Beautifully situated 600 feet above sea level. Facing South, completely sheltered from North and East.

22 miles from Edinburgh.

All modern Baths, Douches, Massage. Fully qualified Masseur and Masseuse.

IDEAL WINTER RESORT.

Electric Light, Central Heating, Electric Lift, Three Billiard Tables, Ball Room, Winter Garden, Swimming Bath, Hard and Grass Tennis Courts, Croquet Lawn, Golf Course.

Prospectus from Manager.

BOURNEMOUTH HYDRO.

A Residential and Treatment Centre. Telephone 341.

Every variety of Electrical, Massage, and Thermal Treatment: Brine, Turkish, Nauheim, and Radiant Heat Baths.

Resident Physician—**W. Johnson Smyth, M.D.**

SMEDLEY'S HYDRO.

MATLOCK. Established 1853.

Physicians: G. C. R. Harbinson, M.B., B.Ch.
R. MacLelland, M.D., C.M. (Edin.).

Prospectus and full information on application to the Manager.

VERNET-LES-BAINS

THE PARADISE OF THE PYRENEES

SUMMER AND WINTER SEASONS
2000 Feet High.

Excellent climate—sheltered from winds—free from humidity. 12 Natural Radio-active Sulphur Springs. Winter treatment of rheumatism, gout, sciatica, nervous affections, broncnitis, convalescence. Sun, air, and rest cures.

Special Nebulisation, Radio-aero bath, and Mechanotherapic treatment.

Resident English-speaking physician, Dr. GESUA from Paris.

Large Thermal Establishments communicating with first-class Hotels; newly furnished Villas, likewise fitted with central heating, inexpensive. Good Club with English Billiards, Ladies' Bridge Rooms, Orchestra, Tennis, Cinema, &c.

Write to General Manager,
Vernet-les-Bains, Pyrenees Orientales.

THE
VICTORIA SANATORIUM, DAVOS, GRISONS, SWITZERLAND.

Altitude **5,200** feet above sea level.

For the Treatment of all forms of TUBERCULOSIS

Situated in the centre of the English Quarter, Davos-Platz. This establishment is intended to receive *English-speaking patients* suffering from tuberculosis.

For particulars apply to the Physician in charge, BERNARD HUDSON, M.D.(Cantab), M.R.C.P., Swiss Federal Diploma, The Victoria Sanatorium, Davos-Platz, Switzerland.

Telegraphic Address: "Relief, Old Catton." Telephone: "290 Norwich."

NERVOUS & MENTAL AFFECTIONS.

Ladies only received.

The Grove, Old Catton, Norwich.—**A High-class Home for the Curative Treatment of Nervous Affections. Voluntary Boarders are also received without certificates.**

For full particulars apply to the Misses MCLINTOCK, or to Dr. S. BARTON, 34, Surrey-st., Norwich, Visiting Physician.

Grove House, All Stretton, Church STRETTON, SHROPSHIRE.

A PRIVATE HOME for the Care and Treatment of a limited number of Ladies Mentally Afflicted.

Climate healthy and bracing.

Apply to Dr. McClintock, Proprietor and Resident Medical Superintendent.

Park Lodge Nursing Home, Bath-road, Reading. Delightfully situated. Vacancies for Chronic PATIENTS. Special attention for mentally afflicted. Ideal rest cure. State registered nurses. Fees from three guineas. Reading 1948.

Bucks Mental Hospital, Stone, near Aylesbury.

The Visiting Committee of this Hospital can receive PRIVATE PATIENTS at a minimum weekly charge of 1½ guineas. No vacancies for female cases at present.

Apply to the Medical Superintendent.

Will Country Doctor take Officer's SON, Slightly Mental case. Could act as Chauffeur in part payment. References exchanged.—Heauen, Hotel Michelet, Dinard, France.

London Temperance Hospital, Hampstead-road, N.W. 1.

Applications are invited for the post of CASUALTY OFFICER (Male) for six months, dating from the 15th January next, at a salary of £120 per annum.

Copies of testimonials, not exceeding three in number, should reach the undersigned on or before the 5th January, 1926.

A. C. ADAMS, Secretary.

St. Mary's Hospital, W.2.

ASSISTANT MEDICAL OFFICER IN CHARGE OF X RAY DEPARTMENT.

The Board of Management are prepared to receive applications for the above vacancy.

Candidates must forward their applications, with copies of testimonials, not exceeding six in number, to reach the Secretary on or before 31st December, 1925.

Candidates must be registered Medical Practitioners or Graduates in Medicine of a University in the British Empire.

The appointment is for five years, at the expiration of which term the holder will be eligible for re-election.

The Assistant Medical Officer in Charge of the X Ray Department will be a member of the Honorary Staff of the Hospital.

W. PARKES, Secretary.

West London Hospital, Hammersmith-road, W. 6.—Applications are invited for the post of HONORARY OBSTETRIC REGISTRAR for a period of one year, eligible for re-election annually. The duties include the preparation of the Obstetric Registrar's Report for the year and the supervision of the records of cases. The candidate appointed must be available as substitute for the Surgeon and Assistant Surgeon for Diseases of Women and for emergency operations when required, and be prepared to undertake such teaching for the Post-graduate College as may be desired.

Candidates are required to be registered under the Medical Act; to send applications so as to reach me not later than Wednesday, 20th January next; to attend the Medical Council Meeting on Friday, 22nd January, at 4.30 P.M., and prior to that date to call upon and send copies of application and testimonials to each member thereof; to abstain from canvassing, but nevertheless to send copies of application and testimonials to each member of the Board of Management, at whose meeting on Tuesday, 26th January, at 5 P.M., candidates must be in attendance.

H. A. MADGE, Secretary.

The Hospital for Sick Children, Great Ormond-street, London, W.C. 1.

A RESIDENT MEDICAL SUPERINTENDENT is required on the 2nd February, 1926.

Gentlemen are invited to send in their application to the Secretary before 12 o'clock on Monday, 4th January, 1926, accompanied by copies of not more than three testimonials given specially for the purpose.

The appointment is made for one year, but may be held, subject to re-election, for a period of three years.

Salary £300 per annum, with board-residence in the Hospital, £10 allowance for laundry, and £18 18s. for the purpose of providing a substitute during annual leave.

Candidates must be unmarried and posses a legal qualification to practise, and must have held a responsible Hospital appointment at a General Hospital.

All candidates must be in attendance on Wednesday, 6th January, 1926, at 5 P.M. precisely, to appear before the Joint Committee if required.

Forms of application and copies of the rules may be obtained from the Secretary at the Hospital.

By order of the Board of Management.
December, 1925. JAMES MCKAY, Secretary.

St. Mark's Hospital for Cancer,

FISTULA AND OTHER DISEASES OF THE RECTUM, City-road, E.C.1.—The Committee of Management invite applications for the post of RADIOLOGIST to the Hospital, to attend on one afternoon a week. Salary £25 per annum. Applications should reach the Secretary at the Hospital not later than Monday, 11th January, 1926.

Mildmay Mission Hospital, Austin-

street, Bethnal Green, E. 2.—Applications are invited for the post of RADIOLOGIST, at present one visit per week required, Wednesday afternoon. The members of the Council are anxious that all members of the Hospital Staff should be in full sympathy with the religious work of the Hospital.

Applications should be sent to the Medical Superintendent.

Royal Free Hospital, Gray's Inn Road,

W.C. 1.—Applications are invited from duly qualified and registered Medical candidates for the post of

SECOND HOUSE PHYSICIAN.

Applications for this post must reach the Secretary on or before 6th January, 1926. All applications should be accompanied by copies of three recent testimonials, stating age and experience.

REGINALD R. GARRATT, Secretary.

The London Lock Hospital

(Founded 1746),

283, Harrow-road, W.9, and 91, Dean-street, W. 1.

HONORARY PHYSICIAN TO THE HOSPITALS.

Candidates for this appointment are requested to send in their applications, with not more than three copies of testimonials, to the Secretary, at 283, Harrow-road, W. 9, not later than January 12th, 1926. Candidates must be Fellows of the Royal College of Physicians (London). The election, which is by ballot of the Governors, will be duly announced to the candidates. No personal canvassing of the Board or Medical Staff permitted.

By order of the Board.

Hy. J. EASON, Secretary.

17th December, 1925.

St. Mary's Hospital, Institute of

PATHOLOGY AND RESEARCH.

Principal: Sir Almroth E. Wright.

Applications are invited from qualified Medical Practitioners for a RESEARCH STUDENTSHIP. This will be tenable for six months, and may be renewed for a second period of six months.

The Institute comprises the following departments: Anatomy and Embryology, Physiology, Pathology, Chemical Pathology, Clinical Bacteriology, Systematic Bacteriology and Immunology.

The student, who will receive an honorarium at the rate of £200 per annum, may elect to carry out his researches in any one of these departments, and would be required to work under the direction of the head of the department concerned.

Preference will be given to old St. Mary's students. For further particulars apply to the Secretary, Institute of Pathology and Research, St. Mary's Hospital, Paddington, W. 2, to whom applications must be sent not later than first post Jan. 12th, 1926.

County of London.

The London County Council invites applications for the appointment of DEPUTY MEDICAL SUPERINTENDENT at Maudsley Hospital, Denmark Hill, S.E. This hospital (161 Beds) has been established for the treatment of Voluntary Cases of Incipient Mental Disorder and provides an Out-patients' Department and a Clinic. Salary £650 a year and temporary addition, making total commencing remuneration approximately £850 a year. No emoluments.

Candidates must be registered to practise both in Medicine and Surgery in England, and unless in the London County Mental Hospital Service must not be over forty years of age. Preference to candidates who served with H.M.Forces during the late war. The appointment will be held only during the pleasure of the Council.

Full particulars and conditions of appointment on form of application (upon which alone application can be made) to be obtained from the Chief Officer, Mental Hospitals Department, The County Hall, Westminster Bridge, S.E. 1. Applications must be received by Tuesday, 12th January, 1926. Canvassing disqualifies.

MONTAGU H. COX,
Clerk of the London County Council.

General Infirmary, Salisbury.

(General Hospital of 147 Beds.)—HOUSE SURGEON (Male) required to commence duty February 1st. Candidates must be unmarried, fully qualified and registered. Salary £150, with board, residence, and washing. Applications, with copies of testimonials, to be sent to the undersigned not later than January 9th.

JOHN S. BIRBECK, House Governor and Secretary.

Manchester Hospital for Consumption

AND DISEASES OF THE THROAT AND CHEST.—Applications are invited for the post of RESIDENT MEDICAL OFFICER at the In-patient Department, Bowdon, Cheshire.

Applicants must be registered. Salary £200, with board, apartments, laundry, and railway contract to Manchester. Duties include attendance on three mornings a week at the Out-patient Department, Manchester.

Applications, with copies of testimonials, to be sent not later than January 8th to C. W. HUNT, Secretary.

Hardman-street, Manchester.

City of Manchester Education

COMMITTEE.

APPOINTMENT OF ASSISTANT SCHOOL MEDICAL OFFICER (MAN).

Applications are invited from fully qualified Medical Practitioners for the post of Assistant School Medical Officer.

The person appointed will be required to devote his full time to the duties of the office, and preference will be given to those who have a knowledge of Refraction.

Salary £600 per annum, rising by yearly increments of £25 to a maximum of £750. There is a yearly allowance of £10 for travelling expenses.

The person appointed will be required to contribute to the Superannuation Scheme of the Corporation.

Forms of application may be obtained from the undersigned and should be returned not later than Saturday, 9th January, 1926.

SPURLEY HEY, Director of Education.

Education Offices, Deansgate, Manchester,
16th December, 1925.

United Services Fund.

HEATHERWOOD HOSPITAL, ASCOT.

RESIDENT ASSISTANT MEDICAL OFFICER.

Applications are invited from fully qualified Medical Practitioners (bachelor) for the above post.

Candidates must have held some appointment in a General Hospital.

The present Hospital accommodation is 136 beds for the treatment of Surgical Tuberculosis and other forms of crippledom.

The appointment will be for a period of twelve months and may be extended at the end of that time.

Remuneration is at the rate of £300 per annum, together with residence, board, and laundry.

The officer appointed will be required to devote the whole of his time to the duties of the office, to give anæsthetics, &c., and generally to act under the supervision and direction of the Medical Superintendent.

Applications, stating (1) age, (2) qualifications, (3) experience and appointments held, accompanied by copies of three recent testimonials, should be forwarded to the Organising Secretary, United Services Fund, 29, Cromwell-road, South Kensington, S.W. 7, before the 8th January, 1926.

Further particulars can be supplied on application to the Medical Superintendent, Heatherwood Hospital, Ascot, Berks.

County Borough of Plymouth.

DIDWORTHY SANATORIUM, SOUTH BRENT.

RESIDENT MEDICAL OFFICER.

Applications are invited from duly qualified and registered Male Medical Practitioners, of at least three years' standing, for the post of RESIDENT MEDICAL OFFICER of the Didworthy Sanatorium (72 beds), South Brent. The gentleman appointed will be required to devote the whole of his time to the service of the Plymouth Corporation, and will be on the staff of the Medical Officer of Health, and must pass an examination by the Medical Officer of Health as to his health. He will undertake such work in the diagnosis, treatment, and prevention of Tuberculosis, and such other duties as the Town Council and the Medical Officer of Health may from time to time direct.

Candidates for the post must not be more than forty years of age, and must have had special experience in the day-to-day supervision of a Sanatorium. A knowledge of work at Tuberculosis Dispensaries will also be considered as an additional qualification, and, other things being equal, preference will be given to candidates who hold a Diploma of Public Health or a Degree in State Medicine.

The salary will be at the rate of £600 per annum, together with furnished residence and washing.

A form of application will not be provided, but candidates should state their ages and whether they are married or single. The appointment will be terminable by three months' notice on either side.

Applications, together with copies of not more than three recent testimonials, should be sent to the Medical Officer of Health at his Office on or before January 6th, 1926.

Canvassing will be a disqualification, but twenty-five copies of the application and testimonials may be forwarded to the Medical Officer of Health, Town Hall, Stonehouse, Plymouth, for the use of the Committee. R. J. FITTALL, Town Clerk.

Municipal Buildings, Plymouth, 10th December, 1925.

Southport Convalescent Hospital and
SEA-BATHING INFIRMARY.

Wanted, a RESIDENT MEDICAL SUPERINTENDENT for the above. Duly registered (administrative experience essential). Salary £600 per annum. Applications, stating qualifications, age, married or single, experience, with testimonials, to be addressed to the Chairman, before January 28th, 1926.

Victoria Hospital, Keighley.
(104 Beds.)—RESIDENT MEDICAL OFFICER required. Appointment for six months, renewable for a further period of six months. Salary at the rate of £180 per annum, with board, residence, and laundry. Candidates, who must be fully qualified and registered, should send applications, with copies of recent testimonials, to the undersigned on or before the 4th January, 1926. M. HOYLE, Secretary.

Bedford County Hospital.—Wanted
from the 15th January, 1926, for a term of not less than six months, an ASSISTANT HOUSE SURGEON, unmarried, Male, duly qualified to act in Medicine and Surgery. Salary £130, with board, lodging, and laundry.

Applications, stating age, qualifications, medical school, together with three recent testimonials, must be sent to December 21st, 1925. BEAUCHAMP WADMORE, Secretary.

Ancoats Hospital, Manchester.
VISITING DENTAL SURGEON.

Applications are invited for the above post. The successful candidate would be required to attend the Hospital when requested to do so by the Honorary Staff. Apply, giving age, qualifications, and experience, with copies of three recent testimonials. By order of the Board.

HERBERT J. DAFFORNE, Secretary.

East Sussex County Mental Hospital,
Hellingly, Sussex.

PATHOLOGIST.

Wanted at the above Hospital a PATHOLOGIST. Salary £500 per annum, with lunch and tea daily. Appointment subject to the Asylums Officers' Superannuation Act, 1909. For full particulars apply to the Medical Superintendent, to whom applications should be forwarded not later than Wednesday, 6th January, 1926.

East Suffolk and Ipswich Hospital,
Ipswich. 260 beds. 6 Residents.

Applications are invited for the appointment early in January of a HOUSE PHYSICIAN and HOUSE SURGEONS. Six months' contract.

Salary at the rate of £100 per annum, with board, laundry, and residence.

Applications, stating age, qualifications, and experience, and accompanied with copies of recent testimonials, to be sent to The Hospital, Ipswich. ARTHUR GRIFFITHS, Secretary.

Wolverhampton and Staffordshire
HOSPITAL.
(Incorporated by Royal Charter.)

A RESIDENT SURGICAL OFFICER wanted. Duties to commence 22nd January, 1926.

Candidates must have held previous post as House Surgeon in a large Hospital. Preference will be given to an F.R.C.S. of England.

The Hospital contains 210 Beds, and there are four Resident Officers.

Salary £250 per annum, with board, furnished rooms, and laundry.

The appointment is for one year, with eligibility for re-election.

Details of duties may be obtained on application.

Applications, together with copies of testimonials, to be forwarded to the undersigned forthwith.

W. H. HARPER, House Governor and Secretary.

Wolverhampton, December 17th, 1925.

Wanted, Assistant with view to
early Partnership. High-class county, Surgical and General Practice. Small hospital. Excellent prospect to keen and energetic man. Oxford or Cambridge Graduate preferred. Must have capital.—Address, No. 263, THE LANCET Office, 423, Strand, W.C. 2.

Coaching.—Wanted, Country Practi-
tioner, qualified in recent years, to receive Male Student and supervise Reading and Final Conjoint. State weekly inclusive terms.—Box 322, c/o F. Aldridge, Advt. Agent, 26, Paternoster-row, E.C. 4.

Locum Tenens Provided
at short notice.

Apply to Mr. PERCIVAL TURNER,

the oldest and only Agent who for forty years, *without agency fee to Principals*, has supplied Practitioners with reliable substitutes.

4 & 5, ADAM STREET, ADELPHI, STRAND, W.C.2.

Telegrams: Epsomian, London. Telephone: Gerrard 399.

After 5 P.M.—Tel. Epsom 335.

Assistantship wanted by M.B., B.Ch.
(Woman). Well received by patients. Experienced in eye work and mental diseases. Age twenty-six.—Address, No. 251, THE LANCET Office, 423, Strand, W.C. 2.

Medical Men, possessing their own
Bacteriological and Pathological Laboratories, can obtain trained, efficient, and experienced Women Laboratory Assistants who are also legally qualified Dispensers. Preparation for Examinations.—Apply, London College of Pharmacy, 7, Westbourne Park-road, W. 2.

Refraction and the ordering of Glasses
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Mr. H. B. Hunter having had thirty
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